

# IRAS

## **Emergence: Nature's Mode of Creativity – The Human Dimension**

Program and Schedule

**The Institute on Religion in an Age of Science**

54th Annual Star Island Conference, July 26 to August 2, 2008



# CONFERENCE STATEMENT

In 2006 we explored the concept of emergence in its physical, geological, biological, and ecological contexts, enriching our sense of connection with the universe and other beings ([http://www.iras.org/Site/Past%20Conferences\\_files/book2006\\_nomap.pdf](http://www.iras.org/Site/Past%20Conferences_files/book2006_nomap.pdf)). This year we will consider emergence in the context of the human, ranging across our cognitive, emotional, linguistic, cultural, artistic, and religious capacities.

Emergent properties arise out of relationships, like the neuronal signaling patterns that generate mental experience or the interpersonal connections that generate communal identity. They can be analyzed in terms of their interacting components, but the synergies that develop can generate higher-order unities with novel properties. Humans exemplify these emergent capacities in our modes of cognition, allowing us to generate phenomena that could not previously exist, such as music, morality, religion, and science.

The core thesis of the conference is that human mental evolution was not just “evolution as usual.” Rather, it was a case of “emergent evolution,” traversing a causal threshold as fundamental as the emergence of life, which in turn made biological evolution possible. Similarly, the emergence of symbolic communication made possible the subsequent co-evolution of brain, language, and culture, driving technology and generating new forms of consciousness in which vast webs of collective cognition and intersubjectivity are possible, many manifest in our religious traditions. These processes can be expected to lead to future transitions – not all human-friendly – that are every bit as revolutionary, demanding that we reflect on our understandings of the true, the good, the beautiful, and the sacred.

Speakers and workshop leaders from many disciplines will join conferees and clergy in considering the consequences of the thesis that human nature is fundamentally emergent. We will explore such questions as: In what ways are uniquely human mental abilities the result of emergent evolution, in contrast, for example, to the evolution of upright posture? How does the human conscious self differ from consciousness in other animals, and how does it arise? How does human language differ from other forms of communication, and what is its role in shaping our consciousness? In what ways might present and projected forms of electronic communication generate emergent changes in human identity and community? Where do our aesthetic and spiritual sensibilities come from? How does the emergence of our symbolic capacities help us understand empathy, meaning, and purpose? Is a cosmology of emergence consistent with existing moral, spiritual, metaphysical and theological frameworks? How might it influence, or even transform, them?

*Philip Clayton*  
*Terrence Deacon*  
*Ursula Goodenough*  
Conference Cochairs



**PRESIDENT'S WELCOME**

Welcome to Star Island!

After wandering in the barren dream of our missed year, now two years out from our last gathering, we are here again, with new phoenix wings to fly to our desire (apologies to John Keats). So stretch those wings, you inspired new participants. I've already heard your gasps – happy memories of my first visit here and every time since. Old Shoalers feel the joy of seeing long-missed friends and the new fledglings under our wings. Welcome all to Emergence: Nature's Mode of Creativity – The Human Dimension.

IRAS, and our delayed conference, generates the greatest of anticipations. Our hearts and minds and spirits open to the horizons, sing with the gulls, beat with the surf. This is our happy retreat from the more mundane, our celebration of relationships with each other, from which the novelties, the surprises, the new blends, all emerge within our sense of place and belonging here. We struggle with ideas, sharing and connecting, then step back to the meditation of rocks and surf, and return again to the cacophony of our voices, the tears that move us, the laughter that redeems and reconnects.

So engage when you can, disengage when you will, as we enjoy the warm community to which we all belong for this week, as we take each other in, all welcome. Speak, and then listen with respect and in communion. Let us see what together will emerge in this dynamic. Knowing the peace, and the passion, of these people and this place, let us leap again into the waters.

*John Teske*  
President of IRAS



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## ORIGIN OF IRAS

In the late 1940s the American Academy of Arts and Sciences organized a Committee on Science and Values to address topics relating contemporary scientific knowledge to fundamental human concerns about life's morals and meanings. The Committee, which included astronomer Harlow Shapley, neurobiologist Hudson Hoagland, geologist Kirtley Fletcher Mather, biologist George Wald, and Ralph Wendell Burhoe, the executive secretary of the Academy, stated that "we believe that ... the survival of human society depends on the reformulation of man's world view and ethics, by grounding them in the revelations of modern science as well as on tradition and intuition."

Several from this committee accepted an invitation to bring their views to an interfaith group at the Coming Great Church Conference on Star Island in the summer of 1954. Later in 1954, the group from the American Academy accepted an invitation of the Coming Great Church Conference to form the Institute on Religion in an Age of Science, a multidisciplinary society that carried forward the work of both predecessor groups. Other leaders involved in the establishment of IRAS included Brand Blanshard, Edwin Prince Booth, Dana McLean Greeley, Donald Szanthy Harrington, Henry Murphy, Lyman Rutledge, and Malcolm Sutherland. Other early members included Ashley Montagu, B.F. Skinner, Theodosius Dobzhansky, and Ian Barbour.

Since 1954 IRAS has held an annual conference on science, values, and religion on Star Island, ten miles off the coast of Portsmouth, New Hampshire. IRAS has also conducted—on its own or in collaboration with other groups—conferences in other places: at universities and theological schools and at meetings of the American Academy of Arts and Sciences, the American Association for the Advancement of Science, and the American Academy of Religion.

In 1965 IRAS joined with the Meadville Theological School of Lombard College (later Meadville / Lombard Theological School) to establish a journal: *Zygon: Journal of Religion and Science*. The first issue was published in March 1966 under founding editor Ralph Wendell Burhoe, director of the newly formed Center for Advanced Studies in Theology and the Sciences (CASTS) at Meadville / Lombard. In 1979, when Karl Peters succeeded Ralph Burhoe as editor, the editorial offices moved to Rollins College in Florida. IRAS, the Center for Advanced Study in Religion and Science (CASIRAS, successor to CASTS), and Rollins College became joint publishers. In 1989 the editorial offices moved back to Chicago under the editorship of Philip Hefner, director of the newly formed Chicago Center for Religion and Science (renamed the Zygon Center for Religion and Science in 1999). During the past quarter century, *Zygon* has been the chief international voice for the scholarly community in science and religion and has greatly strengthened the influence of the IRAS-CASIRAS approach to relating religion and the sciences.

## PURPOSE OF IRAS

IRAS is a multidisciplinary society of persons who seek to understand and reformulate the theory and practice of religion in the light of contemporary scientific knowledge, and to provide a forum for discussing issues relevant to that goal. The IRAS Constitution states the formal purpose as follows:

- (1) to promote creative efforts leading to the formulation, in the light of contemporary knowledge, of effective doctrines and practices for human welfare;
- (2) to formulate dynamic and positive relationships between the concepts developed by science and the goals and hopes of humanity expressed through religion; and
- (3) to state human values in such universal and valid terms that they may be understood by all peoples, whatever their cultural background or experience, in such a way as to provide a basis for world-wide cooperation.

Various other statements of the goals and purposes of IRAS have also been articulated over the years. For example, there is one in the back of each *Zygon* which says "IRAS is an independent society of scientists, philosophers, religion scholars, theologians, and others who want to understand the role of religion in our dynamic scientific world." The statement that appears as the lead-off paragraph in the Orange Book under "Purpose of IRAS" resulted from some discussions by the council before the 2002 Star Island Conference, and is intended to make it clear IRAS is open to all persons who share these goals, and is not some sort of "elitist" organization.

And most recently, the IRAS Council at its 2003 Midwinter Meeting adopted the "Campion Statement," so-called because it originated from discussions at the Campion Center in Massachusetts at the 2002 Midwinter Meeting. The Campion Statement reads as follows:

*We at IRAS take the natural world seriously as a primary source of meaning. Our quest is informed and guided by the deepening and evolving understandings fostered by scientific inquiry.*

*From here, our quests for meaning take us in divergent directions. For some, the natural world and its emergent manifestations in human experience and creativity are the focus of exploration. For some, understandings of the natural world are interwoven with understandings inherent in various religious traditions, generating additional paths of exploration and encounter. As a result, we articulate our emerging orientations with many voices, voices that are harmonious in that we share a common sense of place and gratitude.*

*We acknowledge as well a shared set of values and concerns pertaining to peace, justice, dignity, cultural and ecological diversity, and planetary sustainability. Although we may differ and hence debate on how these concerns are best addressed, we are committed to participating in their resolution.*

IRAS is a nonprofit membership organization. Governance is by a volunteer Council whose members are elected from the entire membership. New IRAS members and tax-deductible contributions are always welcome.

## IRAS ON STAR ISLAND

Star Island, first settled by Captain John Smith in the early 1600s, is situated in what was known as the best fishing grounds in the Colonial world. Today one can still see the lobstermen setting their traps. A small museum and island tours allow one to recapture this early human history; and tours of the local flora and fauna, tide walks, and a marine biology lab help one appreciate the local environment.

Because it is ten miles offshore from Portsmouth, New Hampshire, Star Island's temperature is usually ten degrees cooler than on the mainland. It thus became an ideal resort setting for one of the premier late-nineteenth-century hotels on the east coast. Today the hotel, along with several cottages and motel-type units, is a conference center run by the Unitarian-Universalist Association and the United Church of Christ; these two religious organizations have formed the Star Island Corporation. Although IRAS is not affiliated with any particular religious organization, we have enjoyed the hospitality of the Star Island Corporation since our first IRAS conference in 1954.

The nineteenth-century hotel and other facilities provide both the charm and the amenities of that period. Rooms are provided with wash basins and water buckets, and in most cases the toilet is down the hall. The Star Island management and its staff of mostly college students—called Pelicans—are first rate in meeting the various needs of guests from infants to octogenarians. A highlight of the week is the Pelican Talent show—a delightful extra from the hard-working staff. And in recent years IRAS conferees have returned the favor with their own talent show on the final night of the conference.

Star Island and other islands in the Isles of Shoals are excellent examples of the rocky New England coast. There are no roads, no cars, no bicycles, no TVs, and one public phone. (A cellular phone, 603-534-2190, is for emergencies only.) But there are rocks, bushes, grasses, nesting sea gulls, crashing ocean waves, sometimes fog horns, and sometimes crystal-clear night skies to explore through telescopes with some of our professional astronomers (IRAS's first president was astronomer Harlow Shapley). There are opportunities for swimming, rowing, tennis, and ballroom dancing. And the Star Island Book Store and Gift Shop offer books related to the conference theme and other items to remember the week on the island.

Then there are the people who come to IRAS conferences—more than 200, from a variety of academic and professional fields, as well as many well-educated “lay persons.” Many belong to IRAS, which has about 400 members. Others come because they are interested in how liberal religion relates to science and in the particular topic. There is active dialogue in lectures, discussion groups, conversation on the porch overlooking the harbor and on the rocks, and at the social hour before dinner. For those interested, there are opportunities to meditate and worship together in the stone chapel on a high point of the island, at the gazebo, or in the reflective evening candlelight services.

Those who have been coming for a long time to IRAS conferences believe that the natural setting, the island history, and the people provide a unique opportunity for rigorous meaningful dialogue regarding religion and values in relation to contemporary science.

## GENERAL CONFERENCE INFORMATION

**Chapel services** at 9 A.M. each day begin each day with reflections led by Edmund Robinson and music led by Jane Penfield.

**Plenary session lectures and discussion** are scheduled in the *morning* (starting at 10 A.M.) and *evening* (starting at 7:30 P.M.). The speakers (first hour) will develop the theme of the conference as they address different issues and questions from their own disciplines and perspectives. Following a break there will be general discussion. The porch bell will be rung (a single stroke) 5 minutes before the beginning of the morning and evening sessions, at 9:55 A.M. and 7:25 P.M. We hope this advance warning enables everyone to reach his or her seat in time to allow a prompt start at 10:00 A.M. and 7:30 P.M. A coffee/hot chocolate/bouillon break is scheduled for 10:55–11:15 each morning. When you hear the bell at the end of this break, please return quickly to the auditorium. Abstracts and biosketches of the speakers and respondents begin on page 9.

The **IRAS seminar** will consider chapters from a book in progress by Stacey Ake, tentatively titled *The Semeiosis of the Self: The Quest for Individuality within the Evolutionary Matrix*. It will be held on Monday, Tuesday, and Wednesday, 1:40 to 2:40 P.M., in Marshman. Further information may be found beginning on page 18.

**“Free University”** sessions, from 1:40 to 2:40 P.M. each day except Thursday, provide conferees with an opportunity to present their ideas informally and discuss them with others. If you wish to organize such a session, you need to do two things: 1) Check with Nancy Anschuetz at least the day before for a room assignment, and 2) after doing so, give a written note to Jane Bengtson, editor of the *Star Beacon*, describing your offering and its time and location. The announcement will appear in the *Beacon* and will also be posted on the chalkboard in the lobby.

**Workshops and Discussion Groups** will be offered during the afternoon from 2:50 to 3:50 and 4:00 to 5:00 P.M. Leaders and workshop locations are listed in the schedule on the back page of this program booklet, and workshop descriptions begin on page 20, listed alphabetically by presenter. A special sequence of workshops, the “Pirate Sessions” (page 28), will consider facets of Terry Deacon’s Emergence Dynamics Theory. Other activities such as Meditation, Yoga, and Art are listed beginning on page 31.

**“Happy Hour”** takes place at the end of afternoon activities, from 5:30–6:30 P.M. We gather informally in Newton Center for an hour of libations, snacks, socializing, and, often, music. Contributions to cover the cost are both needed and appreciated. Persons under 21 are not permitted in the beverage-serving area.

**Recreation.** Afternoons are also opportunities for recreation: talking, thinking, napping, reading, walking, and playing. Various tours will be announced, including a trip to the Marine Laboratory of the University of New Hampshire on Appledore Island. (Please sign up at the front desk in advance, as the boat capacity is limited.)

**Swimming.** The hardy (or masochistic) enjoy a Polar Bear swim in the morning before breakfast. The rest of us can swim throughout the day when the lifeguard is on duty.

**Special meals.** There will be a lobster dinner on *Wednesday* (tickets *must* be purchased at the lobby desk by Monday noon). The traditional IRAS banquet will be on *Friday*.

**Shows.** The Pelican show (organized by the Pelicans, the young people who do all the work to make our stay on Star Island so delightful) will be on Thursday evening after the plenary session,

and the IRAS Talent Show is on Friday evening. If you would like to participate in the Talent Show, especially if you have talent (this is an optional requirement; all hams are welcome), Joan Hunter, the talent show coordinator, will be happy to hear from you.

**Newspaper.** The *Star Beacon* is an IRAS tradition. This conference newspaper appears at breakfast each morning with up-to-date information on the conference and its participants. It provides opportunities for you to respond to lectures and the conference theme, challenge ideas, publish poetry, commentary, and other forms of artistic expression, including humor, all at the discretion of the editor, Jane Bengtson, and as space is available. Contributions from our younger conferees often grace the pages.

**Candlelight services** allow time for quiet reflection at the close of each day in the chapel and environs, and follow the evening-program discussion hour. Each service lasts ~20 minutes. This year we are trying out a new format. Sturges Music Fellows Jessica Goodenough Heuser (soprano) and Elliot Figg (keyboardist), sometimes with conferee-musician collaborators, will perform music, usually Baroque/pre-Baroque. A short reflection before and after the music will be offered by conferees in our “young-adult” cohort.

**Star Gazing** takes place on clear nights after Candlelight, generally in the open area near Vaughn, with the Island telescope. Check with Dave Klotz to see if we’ll be observing.

**Memorial Service.** A memorial service for IRAS members who have died during the past 2 years will be held in the Chapel on Friday at 1:40 P.M.

The **snack bar**, open until 11 P.M., is a favorite place for congregating and socializing after the candlelight services.

**Dancing** will take place in Newton Front every evening after the candlelight services. Please bring along any favorite CDs you have with you. Genres will range from ballroom to rock, as requested by those who come.

An informal **farewell party** will be held on Friday night, an important part of which is to use up any refreshing substances left over from Happy Hour.

**Children** must participate in the children’s program unless Nancy Anschuetz receives a signed waiver. See more about the program on page 7.

**Discrimination and abuse.** The Star Island Corporation has requested that all conferences formulate guidelines for the prevention of child and adult discrimination and abuse. The IRAS Council has adopted such guidelines. Information about the policy is available from IRAS President, John Teske.

**Star Island Regulations:** You were sent with your registration packet, and will find in your room, a memorandum on the regulations that govern the Star Island Conference Center. These will also be emphasized in the required “Fire and Water” presentation on Saturday afternoon. Please read and adhere to these carefully, notably those relating to permissible locations for smoking and alcoholic beverages. Illegal substances are of course forbidden at all times. Persons found violating these regulations will be removed from the Island on the next boat and may be barred from attending future conferences, depending upon the circumstances.

If you have any **questions or suggestions** concerning the conference, please bring them up with Conference Coordinator Nancy Anschuetz, or with Co-chairs Phil Clayton, Terry Deacon, and Ursula Goodenough.

## ARCHI PELAGOS: IRAS CONFERENCE YOUTH PROGRAM

Welcome to Star Island!

Oh, how I missed being with you on Star last summer, and how excited I am to be a part of this great conference in our Star Island home. Many of you “did come back” and some of you may find yourselves here to share this gift with your children and grandchildren. Certainly it is love that calls me here each summer. I feel richly blessed to share this time with your children, and I wait in anticipation to see the familiar names on the roster and tell the teachers who will be in their groups. It is such a delight to know we will have this time with them again: to play, create, explore, and especially renew and develop special Star Island friendships. And, of course, there are new staff as well as new young people to share our treasured island with.

We have some traditional activities like scavenger hunts and game day. Then there's that row to Smuttynose (some adults join us) and oft times we have secret friends and most times we hang out and explore in the marine lab and listen to stories and games with the island historian. We'll visit our favorite places all over the island. We'll avoid poison ivy. We'll create things and imagine things. We'll try to incorporate some emergence experiences into our morning program and probably our Thursday evening chapel. And who knows what will emerge for our game day activity? We're hoping to have an opportunity to work with some of the incredible and creative speakers as well. Our program is planned and responsive.

Each parent will receive a handout with the schedule for their child's group at the introduction meeting following the mandatory Star Island orientation session Saturday afternoon. We hope the bulletin board on the porch is available for our daily announcements and copies of the schedules as well as fun stuff to share. The names and locations of the staff as well as the youth will also be posted there. This year we have four groups and 25 youth. Please check the board daily for changes and updates. We will try to get announcements into the morning Beacon as well.

In general, we meet each morning at 9:00 a.m. in age-specific groups until 12:15 p.m. The seniors meet at morning chapel and again afternoons in Parker. The morning session is structured with both energetic and quiet activities. Afternoons are free and youth are under the supervision of parents and guardians until the social hour (5:15–6:15 p.m.). The one exception is Tuesday afternoon when we offer a program from 4:00–5:15 and parents take back responsibility from 5:15, allowing youth staff to socialize that afternoon.

Several mid-afternoons we set up craft or game activities on the porch, and these activities are open to all.

A light afternoon snack is offered at 5:00 p.m. on the front porch of the Oceanic or the well house at the bottom of the stairs. This is round-up time for the games and playground time we supervise from 5:15–6:15.

Following supper we offer a sunset program from 7:30–8:30 p.m. Please note that the evening plenary session often runs beyond 8:30. Parents resume responsibility for their children at the end of the evening program, so they or their designate need to take over supervision. The following is the planned schedule of evening events as well as special events. Bonfires need to be approved by the fire marshal around supper time, so we hope the gods are with us.

Thank you for bringing your precious ones.

Sandra Woodworth, coordinator

## ARCHI PELAGOS SPECIAL EVENTS

Saturday, 7:30–8:30 P.M.	Bonfire with s'mores down on rocks left of summer gazebo (bring flashlight). Sunset can be glorious.
Sunday, 8:30 A.M.	Youth photo (time could change.)
Sunday, 7:30–8:30 P.M.	Theater Improvisation and Games
Monday, 7:30–8:30 P.M.	Bonfire, down on rocks to the left of the summer gazebo (bring flashlight). Story telling and more s'mores.
Tuesday, 4:00–5:15 P.M.	Field games
Tuesday, 7:30–8:30 P.M.	Art Night in Brookfield
Wednesday, 7:30–9:30 P.M.	Drumming and dance in Brookfield (those under 12 leave at 8:30).
Thursday, 8:00–8:30 P.M.	Candlelight Chapel Service by youth. (We gather at 7:40 outside Brookfield and begin the candlelight walk at 8:00.) Parents should meet us at the candle station.
Friday, 5:15–6:15 P.M.	Talent Show in Elliot. Snack will be given out on the porch near the stage at 5:00.

Please check the bulletin board on the porch for daily details and notices of changes or additions.

There will be a brief meeting for parents, children, and staff on Saturday in Elliot, immediately after the Star Island Orientation Meeting. All parents with children in the Archi Pelagos program are required to attend. This is your opportunity to meet the staff, find meeting places, and ask questions. After introductions we will meet with your children until 6:15. Please make sure you know where to collect your children and be timely so staff can arrive to dinner on time. And please remember that Star Island rules require anyone under 18 to be under the guidance and control of a parent or guardian when not in supervised activities.

**Sandra Woodworth**, Archi Pelagos Coordinator, has been involved with the youth program at IRAS from its beginning 14 years back. Her professional background includes teaching English for 12 years in Portsmouth, N.H., then running a before- and after-school program for elementary students for 5 years. Her deepest experience with children comes through her son Asher, now 22, off in Japan studying with the Butoh dancer Min Tanaka.

# LECTURE OVERVIEWS, ABSTRACTS, AND BIOSKETCHES

## GENERAL CONFERENCE OVERVIEW

We rely on causal logic all day long, but rarely stop to think about what it is or how it works. For everyday use, our causal explanatory tool kit seems complete. We've got cause and effect as in one thing bumping into another and moving it (what Aristotle called efficient cause). We've got behaviors being caused by goals and objectives (what Aristotle called final cause—that for which something happens). That seems like enough. When we reach for a causal explanation we find one readily.

Except these don't exactly fit together, and this leads to trouble when we are looking for more complete explanations or more personal ones.

Basically, our scientific tool kit so far hasn't provided an explanation for how efficient and final cause relate. Physics appears to be all about efficient cause (e.g., atoms bumping into each other). Scientists don't talk about the moon wanting to cause the tides to rise. We think of physics and just efficient cause—matter and forces. And yet we can't help but talk about people having goals and wanting things—final cause. How do we go from physics to people and beyond, to societies and religions and cultures with their various goals and purposes?

How can we best deal with this gap between efficient and final cause, between matter and mattering? By the best account science has to offer, nothing resembling final cause existed on earth until just a few billion years ago, with the dawn of life. And even then it took a few billion years more for anything resembling conscious purpose to begin to meddle in the physics and chemistry of the planet. It's with Life that outcomes first appear to matter, and with us humans that merely represented outcomes really become major forces shaping the world. For us, things don't just matter; they seem to matter in a different way.

Regarding this huge persistent gap in our causal story, some suspect that we've got the story wrong. There are three basic strategies for exploring this curious discontinuity in the causal fabric of things, and an array of complex blends between them:

1. **Preformationists** guess that there's no explanatory gap between matter and mattering because actually mattering was always here, preformed in the universe's origins. Perhaps we don't find evidence for it in the first 12 billion years since the big bang because we don't recognize the form that mattering takes in the physical realm. Maybe we'll discover protomattering in the quantum realm. And if we find that initial mattering maybe we will have insight into God.

2. **Eliminativists** guess that actually there's no explanatory gap between matter and mattering because

there isn't any real mattering to explain. After all, even the most intricate beings are still perfectly describable in terms of efficient cause—billiard-ball cause and effect played out at very intricate and complex levels, but still just physics and chemistry. Science has been dissolving mattering right and left. Lightning isn't God expressing his purpose, it's a manifestation of an electromagnetic force—pure physics. Eventually science will deconstruct all mattering and we'll know the physical universe for what it is: simple mechanism.

3. **Mysterians** guess that the discontinuity must be right, and that somehow the whole story does all fit together, but they have come to the conclusion that it's beyond humans to know just how. Perhaps evolution hasn't produced brains capable of grasping such complexity, the way mice are unable to even conceive of the concept of the big bang. Perhaps there is some intrinsic impossibility of comprehending the nature of comprehending. In any case, it is not something we're ever likely to know.

But there is a fourth approach: **Emergentists**, such as those you'll be hearing from this week, guess that the story is right—there is indeed a fundamental gap between matter and mattering—and they believe that the way our best science describes the world is accurate as far as it goes, but that we've still got some explaining to do to bridge that gap. The emergence approach assumes that it is within our capacity to do so. It's not the story that's wrong, it's our understanding of causality that is still incomplete. Neither the folk nor the scientific causal explanatory tool kit is sufficient. Many believe that we have been asking the wrong questions and basing our investigations on erroneous assumptions about some of the most basic features of nature.

From an emergence perspective, mattering emerges out of matter. This says little more than that we should take the appearances of cosmic and biological evolution seriously: simple material processes preceded purposeful processes and are now their substrates. Emergence is the name we've given to the kind of pop, like a sudden phase shift, in which such unprecedented patterns of cause and effect spontaneously arise, producing the equivalent of causal regime changes that are often characterized by virtual about-faces of the usual course of change.

Emergence has mostly been a way of questioning the assumptions upon which our scientific explanations are based. It has not been a scientific methodology for explaining how these fundamental shifts occur, and there still is considerable ambiguity about what should constitute an instance of such a shift. Variant interpretations of the emergence concept will inevitably cross-cut many of the presentations and discussion, and will offer fertile ground for confusion as well as opportunities for clarification. But our interest is not

merely to reflect on the challenges this poses; it is also to explore the possibility that a science of emergence is growing, with the capacity to explain how these transitions occur. We will explore specific examples that cross this threshold from matter to mattering, and attempt to reconstruct the how of emergence. If a scientific account is possible, its implications are sweeping -- for science, for humanity, and for issues of "ultimate concern."

This summer the lens of emergence is focused on the nature of humanness. We are members of an oddly divergent species, engaged in activities radically unlike any other, wielding comparatively enormous causal freedom and power, and yet biologically barely different than our ape cousins. This is evidence of an emergent transition that marks the very foundation of what it means to be human. Was this transition due to a change in the brain, in the way we think, in our growing symbiosis with the virtual world of culture, or due to the way language has reorganized our conceptual world in its image? Whatever account we choose, and even if we conclude that the transition was incremental and shared with our close ape cousins, it cannot be doubted that gaining a clear understanding of emergence is critical to understanding the essence of humanness.

Some of the presentations this week will directly explore the emergence of humanness and try to understand its biological context. Some will argue that the very nature of human thought is emergent. Some will help us to recognize the emergent character of social phenomena, and others will explore the relationship between the emergent and the transcendent. Some will build slowly and carefully the steps leading across emergent transitions, while others will try to locate the possible missteps in our understanding along the way. And finally, we will engage in a dialogue to help find the tools to build an understanding of emergence that satisfies science while also illuminating the path to deeper spiritual engagement with the world.

Beyond this we will be discussing the implications of an emergence perspective for the special kinds of matters that matter most to us—identity, spirituality, and questions of ultimate human values.

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## SATURDAY EVENING

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### HUMAN NATURE FROM NATURE

**Ursula Goodenough**

#### ABSTRACT

Ursula Goodenough will introduce this second IRAS emergence conference on the emergent nature of humanness. From her perspective as a biologist, researching some of the most basic questions about the nature of life and the evolutionary process, she will explain why solving the mystery of emergence is necessary, not only for understanding the nature of life, but also for re-grounding the human spirit in the natural world. Emergence is seen as a key part of an effort to naturalize the sacred in order to be able to sanctify nature. But for it to be a valuable step toward

reintegrating science and religion, the concept of emergence must pass the test of scientific scrutiny and philosophical coherence. The speakers chosen for this task not only take this challenge seriously, but together will struggle to find common ground in a field still struggling for clarity.

## BIOSKETCH

Ursula Goodenough is Professor of Biology at Washington University, where she studies the molecular basis of evolution in green algae and teaches cell biology and evolution to undergraduates. She has served in the IRAS leadership since 1989, presently as VP for Development, and has co-chaired 6 IRAS conferences. She is involved with developing the concept of religious naturalism, and is the author of *The Sacred Depths of Nature* as well as many articles in *Zygon* in this genre. She has five children, including current Sturges Music Fellow Jessica Goodenough Heuser, and four grandchildren, including current conferee Isabella Quinones.

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## SUNDAY OVERVIEW

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Is spirituality uniquely human? Does it have deeper roots? Does it depend upon uniquely human faculties? Can it be fully understood from a naturalistic perspective?

In the morning, Neils Gregersen will address how the emergence perspective may be able to inform theology and help revitalize religion in an age of science. Can we (should we) try to naturalize religion? Have efforts to probe the evolutionary and psychological roots of the emergence of this uniquely human phenomenon provided new insights?

In the evening, Sue Savage-Rumbaugh, whose groundbreaking work communicating across the species barrier has challenged the Cartesian divide between human and nonhuman minds, will provide a lesson in cross-species intersubjectivity. She finds no sharp line dividing human and ape minds, and shows why communication does not respect species or neurological boundaries.

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## SUNDAY MORNING

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### CAN HUMAN CULTURE BE NATURALISTICALLY EXPLAINED? CAN RELIGION?

**Niels Henrik Gregersen**

#### ABSTRACT

The research program of evolutionary cognitive theory of culture and religion (e.g., Dan Sperber, Pascal Boyer, and Scott Atran) claims that religion can be explained in terms of naturally evolved capacities that operate automatically, prior to human reflections, and spread epidemically. The presentation will introduce and discuss this evolutionary theory of religion by asking the following questions: (1) What does it MEAN to say that something can be explained naturalistically? (2) Is

religion to be seen as a UNIFIED phenomenon, or rather as the emergent result of pre-reflective cognitive responses to reality ("prototheology"), of coalitional psychology ("protoethics"), and of biological pressures for the coordination of bodily movements ("protoliturgies")? 3) What are the IMPLICATIONS for the self-understanding of religious traditions if there are such evolutionary underpinnings of religious behavior? What is the role of spirituality and religious experiences, of theological views of reality and of ethical practices?

#### BIOSKETCH

Niels Gregersen, Professor and Chair of Systematic Theology, University of Copenhagen, Denmark, received his doctorate in theology from the University of Copenhagen and held faculty positions at Aarhus University. From 1992 to 2003, he has been a leader of the Danish Science-Theology Forum. From 1998 to 2002, he was vice-president of The European Society for the Study of Science and Theology (ESSSAT) and responsible for its publication program. In 2002, he was elected president of The Learned Society, Denmark and served through 2003. He is a founding member and Executive Committee member of International Society of Science and Religion (ISSR) since 2002. His most recent publications include *Gift of Grace: The Future of Lutheran Theology* (Fortress Press, 2005), *From Complexity to Life: On the Emergence of Life and Meaning* (Oxford University Press, 2003), and *Design and Disorder. Perspectives from Science & Theology* (T & T Clark, 2002). He is associate editor of the *Encyclopedia of Science and Religion* volumes I-II (MacMillan Reference 2003) and systematic-theological editor of *Dansk teologisk Tidsskrift*. Starting in September 2008, he will co-direct a new Center of Naturalism & Christian Semantics at Copenhagen University.

Gregersen's work focuses on two fields: (1) How to develop a constructive Christian theology in the context of secularized and multireligious Western societies, and (2) How to bring about a mutual interaction between science and religion that also allows religious reflection to be an active player. In the field of science and religion, he specializes in the philosophy of evolutionary biology and in the sciences of complexity.

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#### SUNDAY EVENING

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#### LANGUAGE AS OVERT HISTORICAL PROCESS IN THE SKINNERIAN SENSE

**Sue Savage-Rumbaugh**

#### ABSTRACT

The controversial history of ape language will be reviewed in brief, from an explicatory stance designed to elucidate and explicate why the field encountered such a stormy and controversial trajectory. The current state of the field, with regard to findings that are now generally accepted and the evidence to support them, will be reviewed. The findings that are still in doubt and the current position of the critics will be discussed, accompanied by an analysis of the validity of the

critiques. Data not previously noted by the critics will be presented in order to address issues that have plagued the field since its inception, with the goal of placing all investigations into nonhuman language on much firmer methodological/conceptual ground. These data, as well as new data, will address the issues of grammatically, language as dialogical process, and the uniqueness of the specific rearing variables that characterize the bonobo colony at the Great Ape Trust.

#### BIOSKETCH

Sue Savage-Rumbaugh, Scientist with Special Standing at the Great Ape Trust of Iowa, received her doctorate at the University of Oklahoma, where she became interested in the field of ape language through her studies of the home-reared signing chimpanzees, Lucy, Booe, Bruno, Ally, Solome, and Washoe, as contrasted with the abilities of wild-reared and/or mother-reared chimpanzees, Cindy, Thelma, Kiko, Manny, Shadrack, and Meshack. Her earliest publications on the topic of ape behavior reflected her interest and recognition in the need to investigate the socio-cultural variables through the lens of verbal and nonverbal communication in our closest living relatives, the great apes.

She pursued that interest, in collaboration with Duane Rumbaugh, from 1975 until 2004 at Yerkes Primate Regional Research Center and then at the Georgia State Research Center, where she began work with Sherman, Austin, and Lana. These chimpanzees continue to be involved in ape language studies at Georgia State University.

Savage-Rumbaugh relocated the bonobos Matata, Kanzi, P-Suke, Panbanisha, Nathan, Nytoa, Elykia, and Maisha to the Great Ape Trust in 2004, where she continues to do developmental life-span research into the skills of language development in apes. These bonobos represent the only colony of bonobos that has developed linguistic competencies. They have been studied daily since 1975 and represent the longest continuous investigation of ape language ever undertaken. They also represent the only group of linguistically competent apes who have been constantly exposed to the natural vocal 'language' of a wild-raised bonobo and to the vocal language of human beings, as well as the only group of nonhuman apes that engage in vocal (and lexical) dialogue with human caregivers.

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#### MONDAY OVERVIEW

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Is there a special emergent step leading to humanness?

In the morning, Duane Rumbaugh will exorcize the last ghost of behaviorism and demonstrate the necessarily emergent nature of learning as it occurs in ourselves and other complex species. This reconception of the process of learning not only provides insight into the emergent noncomputational nature of cognition, but because it can be studied across species, it provides clues to the evolution of humanness.

In the evening, Mark Turner will explore what's special about human cognition. His work, exploring how the emergent creativity of thought is made possible by

conceptual blending, suggests that this capability may be the critical new tool of thought that provides humans with the capacity for aesthetic and spiritual musings.

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MONDAY MORNING

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THE ROOTS OF EMERGENT BEHAVIORS IN  
MONKEYS, APES, & HUMANS: How Early  
Rearing and Large Brains Help All Primates to be  
More Clever and Intelligent!

**Duane Rumbaugh**

ABSTRACT

The salience theory of learning and behavior is based on Rumbaugh's extensive research into the symbolic capacities of great apes and many monkey species. The theory reinterprets reinforcement, recommending instead the term reward, and recognizes the individual's role in the determination of his/her behavior. It allows for the contributions of instinctive and conditioned behaviors (both Pavlovian and Skinnerian) in the formation of what are termed amalgams (that can be thought of as units of life experience). Amalgams are continually being organized and reorganized by the constructive biases of each species' neural system so as occasionally to provide for the formation of new behaviors, new solutions to old problems, and even new capacities in rare instances. The theory disabuses the notion that all behavior is simply a reflection of associative processes. Rather, it is a reflection of the brain (elaborated via selection) coming gradually to learn by relational processes that, in turn, shape overarching principles and thought via symbols (not all of which must be attributed to learning).

Rumbaugh argues that traditional psychology has oversimplified the interpretation of the learning process, and has therefore missed critical roles that higher-level cognitive organization plays in the formation of useful knowledge about the world. He will outline a more sophisticated mode of ape and human learning than is generally acknowledged, one in which knowledge is constructed from the holistic involvement of the learner with the larger context of the learning environment. The result is "emergent learning," in which a complex set of relationships is inferred from the learning experience, not just simple correlations among stimuli. This emergent nature of complex learning abilities, which has its roots in great ape cognition, is key to the emergence of many of the most distinctive features of humanness, from our symbolic abilities to our tendency to find meaning in the world that goes far beyond the information given.

BIOSKETCH

Duane Rumbaugh, currently Lead Scientist at the Great Ape Trust of Iowa, received his doctorate in experimental psychology from the University of Colorado and was Regents Professor and chair at the Department of Psychology at Georgia State University, where he co-founded the Language Research Center, before moving to Iowa in 2004. He initiated the Lana

Chimpanzee Language Project in 1971 and led the development of a computer-monitored keyboard for that and other projects that included children and young adults whose language development was compromised by severe learning disabilities. From 1969–71, he was the associate director and chief of behavior at the Yerkes Regional Primate Center of Emory University in Atlanta. He is the author and co-author of well over 200 published articles and books on animal intelligence and language learning, including *Intelligence of Apes and Other Rational Beings* with David A. Washburn (Yale University Press, 2003) and *Animals Bodies, Human Minds—Ape, Dolphin and Parrot Language Skills* with W.A. Hillix (Kluwer-Academic Press, 2004).

Rumbaugh's research focuses on comparative learning and language and on behavioral primatology. He is interested in how haptic (e.g., touch) cues and experiences in just touching three-dimensional word-lexigrams might facilitate word learning. He is also interested in how stimulus salience (e.g., their natural and acquired characteristics that direct attention to them) enters into basic learning properties in the absence of reinforcement.

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MONDAY EVENING

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FORBIDDEN FRUIT: THE EMERGENCE OF  
CREATIVITY

**Mark Turner**

ABSTRACT

Fifty thousand years ago, more or less, during the Upper Paleolithic, unmistakable archeological evidence began to accumulate of a remarkable set of human singularities. Human beings began to demonstrate an unprecedented ability to be creative and imaginative in whatever they encountered. Cognitively modern human beings throughout the world since that time have demonstrated this remarkable ability as a routine part of what it means to be human. Cognitively modern human beings have art, language, science, religion, refined tool use, advanced music and dance, fashions of dress, and mathematics. Blue jays, border collies, dolphins, and bonobos do not. Only human beings have what we have. This conspicuous Grand Difference constitutes a puzzling discontinuity in the evolution of life. How could these human singularities have emerged? In *The Way We Think*, Gilles Fauconnier and I proposed that this change happened in the following way (Fauconnier and Turner 2002). The basic mental operation of conceptual integration, also known as "blending," has been present and evolving in various species for a long time. Modern human beings evolved not an entirely different kind of mind, but instead the capacity for the strongest form of conceptual integration, known as "double-scope" blending. I will offer the view that the mental operation of blending is a basic part of human nature, that human beings share its rudimentary forms with some other species, and that the advanced ability to blend incompatible conceptual arrays is for the most part what makes us cognitively modern. It is far from clear how

this advanced human ability for blending evolved. I will explore some of the evolutionary possibilities for the emergence of this mental operation as the engine of the sweeping range of conceptual emergence that characterizes our species.

#### BIOSKETCH

Mark Turner, Institute Professor and Chair of cognitive science at Case Western Reserve University, received his M.A. in mathematics and his doctorate in English language and literature from UC Berkeley and previously taught at the University of Maryland. He has been a fellow of the Institute for Advanced Study, the John Simon Guggenheim Memorial Foundation, the Center for Advanced Study in the Behavioral Sciences, the National Humanities Center, and the National Endowment for the Humanities, and is currently external research professor at the Krasnow Institute for Advanced Study in Cognitive Neuroscience and distinguished fellow at the New England Institute for Cognitive Science and Evolutionary Psychology. The Académie française awarded him the Prix du Rayonnement de la langue et de la littérature françaises in 1996. His research focuses on higher-order cognitive operations that distinguish human beings from other species, with particular emphasis on conceptual integration. His books include: *The Artful Mind: Cognitive Science and the Riddle of Human Creativity* (Oxford University Press, 2006); *Cognitive Dimensions of Social Science: The Way We Think About Politics, Economics, Law, and Society* (Oxford University Press, 2003); *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (with Gilles Fauconnier, Basic Books, 2002); *The Literary Mind: The Origins of Thought and Language* (Oxford University Press, 1997); *Reading Minds: The Study of English in the Age of Cognitive Science* (Princeton University Press, 1991); *More Than Cool Reason: A Field Guide to Poetic Metaphor* (with George Lakoff, University of Chicago Press, 1989); and *Death is the Mother of Beauty: Mind, Metaphor, Criticism* (University of Chicago Press, 1987).

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#### TUESDAY OVERVIEW

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Emergent society: the co-evolution and co-creation of individual, culture, and ecosystem. Is there a semiotic continuum that blends the worlds within and between minds and even between mind and ecology?

In the morning, Keith Sawyer will explore how emergent social phenomena shape the emergent behaviours, identities, and consciousness of their individual participants. He shows that emergent social phenomena are the rule, not the exception, in human life.

In the evening, Eduardo Kohn will take us into the forests of the Amazon to explore the interpenetrating semiosis and meaning-making of the natural-cultural-spiritual continuum that defines the life of the Runa people and their dogs, whose dreams hold special significance for translating between forest and spirit events.

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#### TUESDAY MORNING

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### SOCIAL EMERGENCE: SOCIETIES AS COMPLEX SYSTEMS

**Keith Sawyer**

#### ABSTRACT

Keith Sawyer will propose a new way of thinking about the relationships between individuals and the societies they live in. The argument is based on the idea that social phenomena emerge from the dynamics of communication processes, such as everyday conversation, ritual encounters, and media. He uses this idea to address the key issues in the social sciences: Can social phenomena be explained in terms of individuals' actions and psychological tendencies? Can individuals be limited and constrained by their social situation and, if so, what causes that to happen? Are societies and groups autonomous entities that have causal power over individuals?

#### BIOSKETCH

R. Keith Sawyer is an Associate Professor of education, psychology, and business at Washington University in St. Louis, where he has been on the faculty since 1996. He is the author of ten books, most recently *Group Genius: The Creative Power of Collaboration*, published June 2007 by Basic Books. His research focuses on creativity and on emergence, with particular interest in collaborative groups, children's play, artistic and scientific creativity, and everyday conversation. Among his nine previous books is *Social Emergence* (2005, Cambridge), which draws on sociological theory and philosophy of science to develop a new vision for the social sciences. He has been an improvisational pianist for over 30 years, playing in jazz groups, Grateful Dead cover bands, and with Chicago improv theater ensembles. In his first job after college, he designed videogames for Atari; his titles included NEON, MAGICIAN, and FOOD FIGHT. He lives in St. Louis with his wife, Barb, and their two children.

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#### TUESDAY EVENING

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### ANTHROPOLOGY BEYOND THE HUMAN

**Eduardo Kohn**

#### ABSTRACT

Kohn will take us into the Amazon rain forest to explore the complex ways that the semiosis of a local human community is intrinsically emergent from the semiosis of the forest ecology. This ecology also captures in its tendrils a long colonial history of Runa interactions with outsiders. Human-animal relations within this historically inflected ecology are mediated by an emergent spirit realm peopled by animal masters, the dead, and demons who are revealed in dreams, visions, and everyday experiences in the forest. We will pay particular attention to the ways in which this spirit realm, which grows out of but is not fully reducible to

the realm of the living, has its own unique emergent properties.

Recommended Reading:

Bateson, Gregory. *Mind and Nature: A Necessary Unity*. 2002, Creskill, NJ: Hampton Press Inc.

Haraway, Donna. *When Species Meet*. 2008, Minneapolis, MN: U. Minnesota Press.

#### BIOSKETCH

Eduardo Kohn, currently Assistant Professor of anthropology at McGill University, received his doctorate in anthropology at the University of Wisconsin-Madison. A social-cultural anthropologist, his research is concerned with understanding the ways in which the Upper Amazonian Runa interact with the various beings that inhabit the complex tropical forest in which they live. He argues that analytical frameworks that focus either on what is unique to humans (language, culture, society, history), or on what is commonly supposed that we share with animals, are separately inadequate to understanding these interactions. Accordingly, he is trying to move anthropology beyond this dichotomy by recourse to an emergentist framework, which sees the novelty and possibility that we humans bring to life as standing in continuity with more basic processes in which we are embedded. This attempt to understand the relation between continuity and novelty involves, among other things, attention to the existence of purpose and representation in realms that are not necessarily uniquely human, as well as attention to many sorts of pattern-generating processes that mediate our relations to the world and to the other beings that inhabit it. A recent publication in this trajectory: "How Dogs Dream: Amazonian Natures and the Politics of Transspecies Engagement." *American Ethnologist* 34(1): 3-24, 2007.

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#### WEDNESDAY OVERVIEW

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Emergence of mind and value from an expanded understanding of the physical world.

In the morning, George Ellis will offer a view of science and religion that are in emergent harmony from the bottom up, and by bringing our attention to the departure of modern physics from the mechanism of Newton, may shed light on the widely discussed hope for a link from quantum processes to consciousness.

In the evening, Mark Bickhard will argue that the so-called naturalistic fallacy (the inability to derive norms from facts, ought from is) is not what it seems, and that normativity is a necessary evaluative aspect of representation in general, one that can be understood only in emergent terms. He argues that the key to naturalizing normativity and value, and thus ultimately naturalizing mind, is giving up a substance-based metaphysics.

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#### WEDNESDAY MORNING

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#### EMERGENCE AND TRANSCENDENCE: PHYSICS IS NOT ALL THERE IS

George Ellis

#### ABSTRACT

This talk will have two parts. The first will argue that emergence is possible only through a combination of top-down, same-level, and bottom-up causation, related to Aristotle's four kinds of cause. The second will relate this perspective to issues of transcendence.

In the first part of the talk, the concept of top-down causation in the hierarchy of structure and causation is considered, and the claim is made that emergence of genuine complexity is possible only because of top-down causation. This occurs by higher-level features setting the context for lower-level actions, the resulting constraints thereby creating new possibilities, as emphasized by Terrence Deacon. Five different classes of top-down causation are identified and illustrated with real-world examples: (1) algorithmic top-down causation; (2) top-down causation via nonadaptive information control; (3) top-down causation via adaptive selection; (4) top-down causation via adaptive information control; and (5) intelligent top-down causation (i.e., the effect of the human mind on the physical world). Recognising these forms of causation implies that other kinds of causes than physical and chemical interactions are effective in the real world. Because of the existence of random processes at the bottom (this is where quantum theory enters), there is sufficient causal slack at the physical level to allow all these kinds of causation, usefully expressed in terms of Aristotle's four kinds, to occur without violation of physical causation. That they do indeed occur is indicated by many kinds of evidence; each level of the hierarchy has its own valid kind of causation that supervenes on but transcends the lower levels of causation.

Francis Crick famously said, "You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules." But nerve cells and molecules are made of electrons plus protons and neutrons, which are themselves made of quarks, so why not "You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of quarks and electrons"? And these themselves are possibly vibrations of superstrings. So why did Crick stop at the level he chooses? Undoubtedly because that is the level he best understood and was familiar with! Indeed each scientist will perceive as fundamental the level they happen to work on and understand deeply in causal terms, so they usually assume that causality at that level is real. And that is a reasonable perception if they are all real, as I take to be the case (a table is still a table even though it is made of atoms, for example; and the atoms are also real, as are the neutrons and protons). Crick's dictum either applies

to all levels except the (unknown) bottommost one, or to none. If it applies to all levels, Crick's molecules are no more real than memories and ambitions, but he assumes the molecules are real, so his position is inconsistent. There is no reason to privilege molecules or cells in the hierarchy of structure. If we accept molecular reality, as I do, then we should also acknowledge the memories and ambitions as real, too, for that is then the only consistent position.

In the second part, it is argued that intelligent top-down causation enables interaction of the mind with abstract entities that are of a transcendent nature. The key point is that these entities are discovered, not created, a hallmark property being that what we find is often surprises that were not expected or desired by their discoverers (for example, the fact that the square root of 2 is irrational). The paradigmatic example is mathematics: we are confident that all intelligent species in the universe will discover the same set of mathematical relationships, albeit expressed in different notations, and this is plausibly because they are of a Platonic nature, as argued strongly by Roger Penrose and Alain Connes. A second example is language: Terrence Deacon has plausibly argued that any language system must obey necessary semiotic constraints on universal grammar; these too are discovered by humans rather than being created, because they are based in the underlying logic of what is possible in sound symbolic representation of the real world. Logic itself is a third example. Given these examples, it is not outrageous to claim that the ground principle of deep morality, which can be claimed to be kenosis—letting go, giving up, sacrificing on behalf of the other—is also of this nature, and will also be discovered independently as a deep psychological and moral principle by any morally and spiritually advanced beings in the universe, and hence is transcultural and independent of place and time. The evidence for this is that these principles occur in the deep spiritual branches of all the major world religions. Finally, scientific theories that characterise our understandings of the behaviour of the physical world are also of this nature: we believe, for example, that scientists on any other planet will also discover the existence of the same four fundamental forces we have discovered, and will concur that these forces are of such a nature as to lead to the emergent existence of chemical elements, biomolecules, and life. Thus they will plausibly understand electromagnetism and gravity much as we do. These physics theories, too, are discovered rather than being created: we find out *the way things are* in the real world through the scientific method, and represent them as the laws of physics we teach our students. These theories, albeit expressible in many forms, may be expected to transcend time, place, and culture. No one ever expected quantum theory to be the way it is: it was an unexpected, and to a large degree unwelcome, discovery. Other physicists elsewhere will know this too.

If time allows, I may conclude with a few comments on the nature of existence of the laws of physics themselves (rather than our theories of those laws), and why they

are the way they are, fine-tuned so that they allow life to exist.

#### BIOSKETCH

George Ellis is Emeritus Professor of applied mathematics at the University of Cape Town. His long-term area of academic expertise is general relativity theory and cosmology; while working on this topic at Cambridge University, he co-authored *The Large Scale Nature of Space Time* with Stephen Hawking. On his return to Cape Town in the 1970s, he pursued this work while also being a part-time social activist in the South African context. He has more recently engaged in the science and religion debate, *inter alia* writing *On the Moral Nature of the Universe* with Nancey Murphy. He was awarded the Templeton Prize in 2004. Even more recently, he has engaged in consideration of the emergence of complexity, in particular how it can be that physics underlies the existence of mind and what causal mechanisms allow the crucial brain plasticity we observe. He is currently editor-in-chief of the journal *General Relativity and Gravitation*, and is co-editor of a forthcoming Springer book on the relations of physics, neuroscience, and freewill.

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#### WEDNESDAY EVENING

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#### THE EMERGENCE OF NORMATIVITY

**Mark Bickhard**

#### ABSTRACT

This talk is in four parts:

1. An outline of some fundamental *conceptual barriers* to understanding emergence and normativity that extend back to the Pre-Socratic Greeks. (Normativity: the property of having distinctions, some of which are better than others in specified ways. For example: functional, dysfunctional; true, false; rational, irrational; successful, unsuccessful; moral, immoral.)
2. An indication of a *metaphysical framework* that avoids those barriers, thus permitting models of various kinds of *emergents*.
3. A model of the emergence of normativity in the form of *normative function*.
4. A model of the emergence of (primitive) *representation* from a particular kind of biological function.

The result is a (re-)integration of normative phenomena with the rest of the world: normativity (in multifarious forms) is naturally emergent.

#### BIOSKETCH

Mark Bickhard, currently Professor of cognitive robotics and the philosophy of knowledge at Lehigh University, received his B.S. in Mathematics, M.S. in Statistics, and Ph. D. in Human Development, all from the University of Chicago. He taught at the University of Texas at Austin for eighteen years before joining Lehigh University in 1990 as Henry R. Luce Professor in cognitive robotics and the philosophy of knowledge. He is affiliated with the Departments of Psychology,

Philosophy, Biology, Counseling, and Computer Science, and is director of the Institute for Interactivist Studies. He is editor of *New Ideas in Psychology*, Elsevier. He was director of Cognitive Science from 1992 thru 2003 and of the Complex Systems Research Group from 1999 thru 2005. His work focuses on the nature and development of persons, as biological, psychological, and social beings. This work has generated an integrated organization of models encompassing The Whole Person, which is the tentative title of a book in preparation.

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## THURSDAY OVERVIEW

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Can there be an empirical science of emergence that is sufficient to address the teleological, meaningful, and experiential phenomena of the world? Is emergence intrinsically open-ended? Does it give new meaning to the concept of transcendence?

In the morning, Terry Deacon will argue that understanding emergence depends on a figure/background shift in thinking about physical causality. It can be stated simply: The whole is less than the sum of its parts. Beginning with the question of how DNA acquired the ability to represent other dynamical molecular relationships, he shows how it is parallel to the mystery of how thoughts and conscious agency emerge from neuronal processes. He argues that an empirically based theory of the emergence of teleological phenomena is sufficient to address questions of ultimate concern.

In the evening, Philip Clayton will round out the speaker series with an exploration of some of the issues still to be resolved concerning the concept of emergence and its implications for theology. Is emergence merely a problem of human knowledge or part of the furniture of the world? Where do emergences stop? Do emergence perspectives point beyond naturalism? Is an emergence view more compatible with some rather than other spiritual traditions and theological concepts? What might an emergence theology look like?

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## THURSDAY MORNING

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### THE WHOLE IS LESS THAN THE SUM OF ITS PARTS: Tools We Need for Building the Bridge from Matter to Mattering (Before It's Too Late)

**Terrence Deacon**

#### ABSTRACT

Over the past century, a different sort of link between the physical and mental accounts has been imagined, fostered by those not willing to give up either the completeness and unity of physical nature or to deny the real and yet special features of representation, consciousness, and value. It is not so much a theory as a criticism of what were assumed to be the only two contenders. This approach is called emergentism. Its underlying motivation can be distilled to the belief that this chasm exists, that there is a real discontinuity of

some sort involved, but that the gap can be crossed, and indeed has been crossed, at least with the evolution of consciousness, and probably with the origin of life. Unfortunately, even as it seems that it must be the case, trenchant philosophical analysis appears to show us that it cannot be the case. To assume that discontinuously novel forms of physical causality can emerge appears to tacitly smuggle in a form of dualism; to assume continuity appears to reduce emergent causality to a mere redundant re-description. *Ex nihilo nihil fit*.

The failure of emergence theories to answer their critics is a reflection of an immensely influential foundational assumption that is caricatured by the classic statement, "The whole is more than the sum of its parts," or as Aristotle more delicately put it, "The whole is over and above the sum of its parts." Thus the functionality that we observe in organisms, and the mental properties we see correlated with brain functions, are conceived of as "not reducible to" but rather something "more than" or somehow "above" the physical processes we can directly interact with and measure. But this has it precisely backwards, and that is the problem.

In this presentation, I will argue that the answer lies not in more, but less.

A quick consideration of the phenomena we hope to gather under the banner of meaning and value shows that the common distinguishing feature in each case is "an existence determined with respect to something not there." This is as true of an organism's adaptations as it is of thoughts and conscious experience. I call this quality "constitutive absence." Take a completely simple example: the function of an automobile engine. If the function fails because of a breakdown in some crucial component, has something been lost or gained? What has been lost? No laws of physics are missing. It just doesn't behave in the narrow way I require in order to use it for travel. In fact, the parts are now capable of juxtapositions and interactions that were prevented when it was functioning, and some of these "additions" may have caused the failure. Its lost function is due to a change in the constraints on what can and cannot happen. And so, conversely, its function was a reflection of these constraints -- not some extra physical possibilities added, but rather the narrow limits on the way the physical laws were able to be expressed.

And similarly with life. Death follows when the narrowly maintained constraints on the untold billions of molecular and cellular interactions relax too far. Death is in this way an increase in these degrees of freedom. What was prevented, is allowed. Physics and chemistry as usual, and more of it. Notice too that absence is the essence of thought, representation, and even value. In a similar way, the contents of our thoughts aren't signals in the brain. They are something these signals are not, something merely virtual, that emerges through the mediation of these patterns of impulses in a living person, but which can nevertheless come to be a source of physical efficacy.

Emergent dynamics, as I call it, is an effort to explain how spontaneous constraints on dynamical possibilities can interact and compound on one another, level upon

level, to produce a convoluted network of causes and effects whose symmetry of absent possibilities becomes its most defining causal feature. Recognizing that the generation of order and symmetry are, after all, merely the positive expression of such a reduction of variety is the first step toward understanding how what is not there can become the most potent determinant of what can occur.

Although it took the tools of 21<sup>st</sup>-century science to bring us to this realization, those tools that helped us probe into the details of the atom or the intricacies of the brain cannot be expected to unlock the door to a science that encompasses both physics and mind. Tools for further and further dissecting the stuff of the world are insensate when it comes to the constitutive absences that are the basis of emergent phenomena. So closing this scientific gap is not waiting on the invention of more sensitive instruments, nor is the secret buried in quantum strangeness where we can't quite get at it. And it isn't even the complexity of brains that holds us back. Here the difficulty lies at the base, in the simple assumptions we begin with and never think to question. The solution is not complex, just deeply counterintuitive. This is where the origins of life problem and the origins of consciousness mystery converge. The "several powers" that Darwin imagined to be first "breathed into" one or a few forms destined to be the founders of life, could not have been complicated. Life's "so simple a beginning" must have involved a convergent synergy that was spontaneous and spare in its detail. And yet this transition straddled the chasm between chemistry-as-usual and chemistry organized for itself. It necessarily bridged the Cartesian "epistemic cut," at a point where it was not a chasm but merely a tiny fissure, but it began a process that would, like the persistent chafing of a stream, create an ever-growing discontinuity. Its most striking consequence, conscious experience, though unquestionably entangled in a vastly more complex causal web, also crosses this same threshold moment by moment. Standing back from some of this complexity, I will show how the same underlying logic is fundamental to crossing both thresholds, and how this slip knot in the topology of simple causality gets tied by the interplay of thermodynamic and self-organizing processes, thereby handing physical efficacy over to absence.

Understanding how causality can become intimately entangled with absence is the first step toward recognizing our unbroken kinship with the physical world, to accepting that we belong, having emerged from, and have not simply been placed in the world. If science is going to provide us with a vision of the universe in which our experience as conscious agents makes sense, it will need to grow beyond simple materialism to embrace the centrality of what is not there, but matters nonetheless. If religion is to continue to provide a source of solace and inspiration in a world progressively demystified by science, it will need to find a way to embrace the realization that the teleological properties of things, including those of our own thoughts and desires, are emergent, and not primary constituents of the universe nor imposed from outside.

## BIOSKETCH

Terrence Deacon received his PhD in biological anthropology from Harvard University in 1984. He was a professor at Harvard from 1984–1992, a professor at Boston University from 1992–2002, research associate at Harvard Medical School from 1992–2000, and is currently a Professor in the Department of Anthropology and the Program in Neuroscience at the University of California Berkeley. His research has focused on brain evolution and development, and particularly the neurobiology of language. He has authored over 100 published works, and his 1997 book *The Symbolic Species: The Co-Evolution of Language and the Brain*, was an effort to synthesize neurological, evolutionary, linguistic, and even philosophical approaches to understanding human mental evolution. (That book was the 2005 Staley Prize winner for the most important book in Anthropology.) Terry has been a frequent speaker at Star Island, a member and vice president for science of IRAS, and has contributed papers to a number of science and religion dialogue conferences and edited volumes. He lives in the Bay Area with his wife Ray.

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### THURSDAY EVENING

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#### SO YOU WANT AN EMERGENCE-BASED WORLDVIEW? Five Models for Speculating Beyond the Science

Phillip Clayton

#### ABSTRACT

I endorse the emergence perspective in the fields where it does real scientific work (e.g., origins of life research, studies of evolutionary development, adaptation and speciation, ecosystems studies, and studies of language and cognition). But I also endorse it as a sort of meta-perspective on the history of life and culture on this planet. As this week will show, emergence is especially powerful for understanding human life. Emergent phenomena are foundational in psychological, sociological, and anthropological studies, and there is hardly an aspect of human existence that does not bear its imprint.

Nevertheless, in this talk I wish to explore the limits of emergence language. What happens when we ask about the meaning and significance of human existence as a whole? Metaphysical or metabiological questions have a "logic" of their own, one that's not identical to science. Different sorts of evidence apply here, and radically different kinds of hypotheses merit our attention. In short: *emergence as a worldview* is different than *emergence as science*. I want to ask: *how* is it different? What new rules apply, and what values reign? What options are available to those of us who want not only to understand the sciences of emergence but also to employ this concept as part of a world- and life-view that we might also live by?

Of course there is not just one answer. In these reflections I would like to present five *different*

emergence-based worldviews—some minimalist, some naturalistic, some primarily ethical, some open to more-than-naturalistic transcendence, and some explicitly theistic. Although I am willing to go as far as theism, the aim of the talk is certainly not evangelistic. Rather, I want to explore with you what happens when one moves from scientific conclusions to those beliefs and values that function as one's religious or spiritual "location." My hope is that recognizing these major options will help conference participants to formulate their own positions in a more powerful and consistent fashion.

#### BIOSKETCH

Philip Clayton is Ingraham Professor at Claremont School of Theology and professor of philosophy and religion at Claremont Graduate University. He completed his doctorate at Yale University in both philosophy of science and religious studies. He has held visiting professorships at Harvard Divinity School, as Humboldt Professor at the University of Munich, Senior Fulbright Fellow (also in Munich), and Visiting Fellow at St Edmund's College, Cambridge University. He is the author or editor of seventeen books and some 100 articles in the philosophy of science, philosophy of mind, philosophical theology, and related fields. Publications include *The Problem of God in Modern Thought*, *God and Contemporary Science*, *Explanation from Physics to Theology*, *Evolution and Ethics*, *In Whom We Live and Move and Have Our Being*, *Mind and Emergence: From Quantum to Consciousness*, and *In Quest of Freedom: The Emergence of Spirit in the Natural World*. Clayton's newest work, *Adventures in the Spirit*, will shortly be published by Fortress. He also edited *The Oxford Handbook of Religion*

and *Science* and (with Paul Davies) *The Re-Emergence of Emergence: The Emergentist Hypothesis from Science to Religion*.

Clayton's quest is to develop a constructive liberal theology in dialogue with metaphysics, modern philosophy, and science. The demands of this task have led to his work and publications in the theory of knowledge; the history of philosophy and theology; the philosophy of science; physics, evolutionary biology and the neurosciences; comparative theology; and constructive metaphysics. A panentheist, he defends a form of process theology that is hypothetical, dialogical, and pluralistic. He is the architect of a comprehensive emergence theory in which religious concerns and ideas of ultimacy have a central place. Both Clayton and Niels Gregersen (see above) argue, in their distinctive voices and from their distinctive perspectives, that emergentism can accommodate the concept of God without conflicting with the methods and worldview of science. Both seek to guide the future of Christian theology toward a rapprochement with modern science, understood in the nonreductive sense that emergence theorists are developing.

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#### FRIDAY MORNING

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#### ALL-CONFERENCE DISCUSSION

**Jeremy Sherman, Leader**

#### BIOSKETCH

See biosketch on page 29.

### IRAS SEMINAR

In the IRAS Seminar we explore a recent book or manuscript by a member of IRAS, followed by open discussion by all who would like to participate. If you have book-chapter downloads, bring them with you!

#### DESCRIPTION AND PROCEDURE

This summer Stacey Ake, Assistant Professor of Philosophy at Drexel University, is our writer, with three discussants (Jeff Dahms, Bill Falla, and Maynard Moore) responding to 3 abridged chapters of her book *The Semeiosis of the Self: The Quest for Individuality within the Evolutionary Matrix*. The sessions will be chaired by Bob McCue.

On the first day of the seminar, we will be discussing "On Biology"—what role does the physical biology of the brain and the body play in the creation of an individual trait? The text will reference the work of Antonio and Hanna Damasio, Gerald Edelman, and VS Ramachandran. The respondent to this paper will be Jeff Dahms.

The topic of the paper for the second day, "On Language," will examine the role of communication in the creation of an individual human self, as well as how language may specifically channel human beings in particular directions. The viewpoints under consideration will include the work of CS Peirce, Walker Percy, and Oliver Sacks. The respondent on the second day will be Bill Falla.

The paper on the third day, "On Morality," will present one particular view of the "evolution" and role of "self" in moral praxis, specifically addressing the question of whether a self is even necessary for morality to exist within and among human beings, -- i.e., is "morality" a faculty, a feeling, or something else entirely? This paper will also speak to the role "religion" plays (or does not play) in what we call "morality". The respondent to this paper will be Maynard Moore.

## BIOSKETCHES

Stacey Ake is an Assistant Professor of philosophy in the English and Philosophy Department at Drexel University, where she has been since January 2004. Before that, she was the editor of the online magazine of the Metanexus Institute, where she got to know most of the wonderful people involved in the science and religion dialogue. She has also worked at the University of Copenhagen, Denmark, where she was a researcher at the Sören Kierkegaard Research Center, as well as a member of the Biosemiotics Circle of the Institute of Molecular Biology and the Niels Bohr Institute. Her interests range from existentialism to neuroscience, with sidesteps in theology, literary theory, neutral evolution, ethics, infectious diseases, and human genetics. She holds doctorates both in biology (with a specialization in evolutionary genetics) and philosophy (with a concentration in semiotics and existentialism with a hint of theology). She is also a published poet and short story writer who does readings in the Philly area.

**Bob McCue:** see Biosketch on page 24.

**Jeff Dahms** is an Australian physician-surgeon and research scientist who works intermittently in primary care in developing countries. He is an independent scholar (meaning no one will employ him) and his scientific interests are in mind/brain evolution and the philosophy of science, particularly in the fundamental areas of physics and biology, and in relational areas such as the science/religion/culture discussion. He is a fundamentalist philosophic naturalist who dances with theists.

**Bill Falla** is an adjunct in the Philosophy Dept. of Moravian College. He has a B.A. in chemistry from Harpur College; M.S. in geology from Penn State; M.Div. from United Theological Seminary in Dayton, OH, and Th.M and Th.D. from Lutheran School of Theology at Chicago in the area of science and religion. He also currently serves a UCC parish as Pastor.

**Maynard Moore** served on the host committee staff for the "Science and the Spiritual Quest II" Conference sponsored by the Center for the Study of Science and Religion at Berkeley, held at Harvard in 2001. He has also been a participant in several science and religion symposia through past involvement with the John Templeton Foundation (JTF) and the Metanexus Institute in Philadelphia (see below). Through the International Consortium on Religion and Ecology, he participated in the preparation work group for the "Future Visions" consultation in New York City in 2000, co-sponsored by the State of the World Forum and the New York Interfaith Center. He supported Bawa Jain, Secretary General of the Millennium World Peace Summit of Religious and Spiritual Leaders, on schedule

coordination, and assisted Dr. Douglas Johnston, Director of the International Center for Religion and Diplomacy, in planning the Summit Agenda.

In 2003, he participated in the three-day symposium at MIT, hosted by the McGovern Institute, that featured the Dalai Lama and several Buddhist scholars. Most recently he was a session leader for several discussions at the MIT Conference on "Our Brains and Us: Neuroethics, Responsibility and the Self," co-sponsored by the AAAS, leading 3 sessions: The three sessions: "Moral Responsibility: What is 'Self' Anyway?" "Neuromorphic Microchips: What is 'Mind' Anyway?" and "Moral Agency: What is 'Free Will' Anyway?"

He has been involved in the science and religion dialogue for about ten years, through the DoSER program coordinated at AAAS, and also in an on-going dialogue group in the Washington DC area which is part of the Metanexus sponsored "Local Societies Initiative." During 2001-2002 he coordinated a series of sixteen formal sessions in Washington DC that involved prominent scientists, including seven Nobel Laureates, among them Charles Townes, Julius Axelrod, and William Phillips.

For some years now he has been a participant in programs "to foster advances in the dialog between the sciences and religion and theology within all world religions," some of which have been sponsored by the JTF. He served as major gifts coordinator for the Campaign for Forgiveness Research, sponsored by the JTF, and has been a participant in such symposia as "Cosmos and Creation," at Loyola University, Baltimore, MD, May, 2002; Religion & the Natural World, Symposium at National Cathedral, Nov 2002; "Empathy, Altruism and Agape," Harvard University, Fall 2002; "Forgiveness & Reconciliation" with Archbishop Desmond Tutu in Boston; Symposium celebrating John Archibald Wheeler at Princeton, Fall 2002; Celebration for Freeman Dyson at the National Cathedral, Fall 2001; and "Evolution: New Pathways," Metanexus, Haverford College, June 2001.

Currently he serves on the Board of Directors for the InterFaith Conference of Greater Washington DC, one of the nation's oldest such organizations, now embracing eleven different faith traditions. In addition, he maintains active memberships in the Center for Process Theology at Claremont Graduate Seminary in California, and the Churches' Center for Theology and Public Policy in Washington DC. He has completed work for two graduate degrees from S.M.U., an M.A. from the University of Chicago Divinity School, and the Ph.D. in higher education/adult education at the Union Graduate School in Cincinnati, Ohio.

## IRAS WORKSHOPS

In IRAS Workshops, topics related to the conference or of continuing general interest are explored and discussed in small groups. Workshops are listed alphabetically by presenter.

### TOWARDS A UNIFIED FIELD THEORY OF HUMAN BEHAVIOR (GLOBAL CULTURAL EVOLUTION)

Sunday, 2:50–3:50 P.M., Newton Front

**Marcus Abundis**

#### ABSTRACT

This workshop will present a general model for human consciousness, explore challenges and merits in advancing such general models, and discuss collaborative interests in refining models on consciousness. (For those interested, a 24-page introductory paper is available for review prior to the workshop.) The model presented uses Earth's geologic history of mass-extinction and recovery as a basis. Five earthly dynamics trigger within humanity's adaptive psychology an "adverse relationship" with the environment, a paradox that sparks human consciousness with intellectual and spiritual questions of unity vs. diversity, Earth/Mother vs. humanity. Humanity adaptively mirrors Earth's five evolutionary dynamics with five gender-based archetypes that unfold in the mythologizing of natural adversity as foundation for all human knowledge, i.e., a biocultural dynamic.

#### BIOSKETCH

Marcus has spent 20 years in international high-tech business, as a teaching assistant at Stanford Graduate School of Business (GFTP). He has spent eight years as an independent researcher in consciousness. Beginning in 2007, he has presented a general model for human consciousness at the Universities of Salzburg, Budapest, Aarhus, Yale, and Arizona and the College of William and Mary—described as "a broad, comprehensive, and original treatment of this huge and supremely significant topic." Marcus holds an MBA from UCLA and lives and works in Europe and the USA.

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### MEMES AS INDEPENDENT REPLICATORS

Wednesday, 4:00–5:00 P.M., Newton Front  
*continues* Thursday, 2:50–3:50 P.M., Newton Front

**John Ball**

#### ABSTRACT

Memes are the smallest recognizable pieces of cultural information, the building blocks of ideas. Richard Dawkins, who invented the term, argues that memes are independent replicators subject to mutation and natural selection closely analogous to genes. I would point out some of the consequences of this hypothesis by taking several well-known genetic phenomena and translating them into memetic language.

The principal difficulties of modern civilization stem from our lack of understanding of how and why societies function. How can we design a good society without such understanding? We humans comprehend our own behavior only very loosely. Is such understanding likely to grow out of present research in sociology, psychology, or even anthropology? These fields are almost devoid of theoretical bases. We have huge collections of seemingly random observations with hardly any theoretical bases or even patterns connecting them. Can meme theory help?

The metaphor of purpose—genes and memes function as if their only (teleonomic) purpose were to propagate and perpetuate themselves—is a rarely deceptive and often powerful way of thinking. This metaphor applied to both genes and memes is valuable for exposition and also for understanding. This metaphor applied to memes leads to some insights into human social behavior.

#### BIOSKETCH

John has a PhD in radio astronomy from Harvard University, and he worked for Harvard in the Center for Astrophysics for some fifteen years as a research fellow and director of Radio Astronomy Facilities. Since 1984, he has been a research scientist in radio astronomy at the MIT Haystack Observatory in Westford, MA. He retired from Haystack in 2006 June, but still works there part-time. He is now also an adjunct professor at Worcester State College, Worcester, MA, where he is teaching an introductory astronomy course.

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### THE EMERGENCE OF EPISTEM-ONTOLOGY: NATURE-CULTURES, BIO-HISTORIES AND THE IMPLICATIONS OF EMERGENCE FOR KNOWLEDGE CLAIMS

Monday, 4:00–5:00pm, Sandpiper

**Whitney Bauman and James Haag**

#### ABSTRACT

The "split" between epistemology and ontology assumed by philosophical foundationalism (Descartes) has been a problem for western philosophy for at least the past 500 years. Moving between Idealism and Materialism, philosophers have tried to subsume all of reality under one side of the equation: roughly, Idealists reduce reality to epistemology and Materialists to ontology. The "re-emergence" of emergence challenges the simple distinction between mind/matter, epistemology/ontology, culture/nature, and the causal mechanisms between them. Likewise, many "post-foundational" thinkers have begun to develop epistemologies based upon humans as "natural-cultural"

(Haraway) or “bio-historical” (Kaufman) beings. This workshop will examine the implications of emergence for developing an epistem-ontology that avoids both idealism and materialism, and resituates human knowledge/being within the rest of the natural world.

#### BIOSKETCH

Whitney Bauman finished his PhD in theology and religious studies at the Graduate Theological Union in Berkeley in May 2007. He is currently a research associate with the Forum on Religion and Ecology and the Book Review Editor for *Worldviews: Environment, Culture and Religion*. He will be assistant professor of religious studies at Florida International University starting in the fall of 2008 and his dissertation will be published by Routledge in early 2009: *The Divine Image and Environmental Ethics: from Creatio ex Nihilo to Terra Nullius*.

Haag: See biosketch on p. 29.

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#### LETTING THE ADVOCATES OF INTELLIGENT DESIGN HAVE THEIR SAY

Monday, 4:00–5:00 P.M., Newton Front  
*continues* Tuesday, 2:50–3:50 P.M., Newton Front

**Muriel L. Blaisdell**

#### ABSTRACT

Using the DVD “Unlocking the Mystery of Life,” we will see most of the major proponents of intelligent design and hear their arguments for irreducible complexity as an argument against evolution. Discussion will probe the assertions in the DVD and consider whether there is any validity to anti-Darwinian arguments.

#### BIOSKETCH

Muriel L. Blaisdell is professor of interdisciplinary studies and history at Miami University in Oxford, Ohio. She is an historian of science and teaches courses on the history of evolutionary biology and on science and religion. She is a member of the IRAS Council.

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#### THE EMERGENCE OF MATHEMATICAL BEAUTY FROM THE MYSTICAL: FROM MYTH TO MATH

Thursday, 4:00–5:00 P.M., Newton Front

**Paul H. Carr**

#### ABSTRACT

“If nature were not beautiful, it would not be worth knowing.” (Poincare) The awesome beauty of nature lured ancient people to explain the world with myths. The mathematical beauty of modern science emerged from the mystical beauty of these spiritual stories. The emergence of astronomy from astrology is an example. The ancient Greeks explained the rising and setting of the sun by having their sun God Helios drive his chariot, pulled by four beautiful winged horses, across the sky. In 590 BC Pythagoras believed that the planets rotating about the earth made the beautiful “music of the

spheres,” because the planetary radii are in the same intervals as the musical scale. In 1543 Copernicus proposed his new cosmology of “the sun at the center of the most beautiful temple.” In the 17th century, Newton discovered the laws of gravity and dynamics of “the beautiful system of the sun and planets.” Today, the mathematical beauty of Einstein’s general relativity frames the whispering cosmos, the “cool” remnant radiation from the hot Big Bang. Even though our concepts of the universe have changed, we perceive it as awesome and beautiful. Beauty is an eternal object, according to philosopher A. N. Whitehead.

#### BIOSKETCH

This workshop is based on the chapter “From the ‘Music of the Spheres’ to the Big Bang’s Whisper” in Paul’s book *Beauty in Science and Spirit*, 2006, Beech River Books. His manuscript was discussed at the 2005 IRAS seminar. The Templeton Foundation awarded him a grant for the philosophy course “Science and Religion: Cosmos to Consciousness” that he taught at the University of Massachusetts, Lowell. In his former life, Paul led the Component Technology Branch of the Air Force Research Laboratory, which investigated ultrasound, surface acoustic waves (SAW), superconductors, and laser-activated antennas. His 80 scientific papers and ten patents have contributed to new components for radar, TV, and cell phones. He earned his BS and MS from MIT and his PhD in physics from Brandeis University. Please visit his home page at [MirrorOfNature.org/](http://MirrorOfNature.org/).

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#### FOUNDATION STONES

Sunday, 2:50–3:50 P.M., Elliot

**Tyrone Cashman with Terrence Deacon**

See abstract and biosketch on page 28.

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#### WEBSITE DESIGN FOR RELIGIOUSNATURALISM.ORG

Sunday, 4:00–5:00 P.M., Sandpiper  
*continues* Wednesday, 4:00–5:00 P.M., Sandpiper

**Michael Cavanaugh, Jerald Robertson  
and Alton Jenkins**

#### ABSTRACT

Religious Naturalism has a puny website owned by Cavanaugh, who has asked Robertson and Jenkins to help improve it, with Robertson primarily responsible for design, Cavanaugh primarily responsible for content, and Jenkins primarily responsible for book treatment. We want input and help from anyone who self-identifies as a Religious Naturalist, and so this will be a “workshop” in the truest sense of the word.

#### BIOSKETCH

Michael Cavanaugh is a retired lawyer, Alton Jenkins is a retired computer programmer, and Jerald Robertson is a retired physicist.

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THE GOD DELUSION OR THE DAWKINS  
DELUSION: ARE EVOLUTION AND THEISM  
ENGAGED IN A WAR TO THE DEATH?

Tuesday, 4:00–5:00 P.M., Elliot  
(see below, also)

**Philip Clayton**

ABSTRACT

The uneasy truce between evolutionary biology and theism has been shattered by a flurry of recent books by well-known authors—Daniel Dennett, Sam Harris, and especially Richard Dawkins. The former rhetoric of complementarity, or peaceful co-existence, has been replaced by the language of antagonism, if not battle to the death. In this session we examine the arguments of the “new atheists” to determine whether they do indeed establish a fundamental incompatibility between biology and belief in God. If it turns out that there are no new arguments here, why is it that the battle is flaring up again so intensely at this time?

BIOSKETCH

See biosketch under “So You Want an Emergence-Based Worldview?” on page 18.

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A WORKSHOP IN CONSTRUCTIVE  
THEOLOGY: RETHINKING THE DIVINE IN  
LIGHT OF EMERGENCE

Wednesday, 4:00–5:00 P.M., Elliot  
(see below, also)

**Philip Clayton**

ABSTRACT

This session is intended as a genuine workshop, not a lecture. Assuming that cosmic history does indeed manifest a strong form of emergence, how might this fact affect constructive religious reflection on the nature of the divine? What models of God are consistent with a universe that exhibits radical emergence? More generally, which beliefs from the world’s religious traditions are consistent with emergence, and which stand in tension with it? The goal of this workshop is to foster individual religious reflection that begins with the scientific results but is willing to speculate, construct, imagine and dream beyond them.

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ADDITIONAL DISCUSSION SESSION

Thursday, 4:00–5:00 P.M., Lawrance

**Philip Clayton**

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AN EXAMPLE OF EMERGENCE FROM  
PHYSICS

Monday, 4:00p–5:00 P.M., Lawrance

**Herb Fried**

ABSTRACT

I shall present and discuss a simple example of two well-known and soluble problems, which, when considered together, exhibit the fact that a Whole can be greater (and have far more complicated structure) than the sum of its Parts.

BIOSKETCH

Herb Fried is an emeritus professor and research professor of (theoretical) physics at Brown University, and is currently engaged in three Hot Topics of cutting-edge research.

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RELIGIOUS NATURALISM IN IRAS AND IN  
UNITARIAN UNIVERALISM

Tuesday, 4:00–5:00 P.M., Sandpiper

**Ursula Goodenough and John Hooper**

ABSTRACT

Religious naturalism (RN) entails an exploration of the religious potential of our understandings of the natural world. This workshop will introduce two on-going RN initiatives: the RN Interest Group associated with IRAS, and a proposed affiliate group within Unitarian Universalism called UU Religious Naturalists. We welcome both those who are already involved in these activities and those who are curious about what we are up to.

BIOSKETCH

Goodenough: See biosketch under “Human Nature from Nature” on p.9.

John Hooper is a retired scientist and former research and development director for Scientific Imaging Systems at Eastman Kodak. A member of the Unitarian Church in Westport, CT, John has served on congregational committees, given seminars, and chaired book discussion groups on science and spirituality (including one on Ursula’s *Sacred Depths of Nature*), and led summer services on topics related to science and religion. Dr. Hooper is a member of IRAS and president of the Unitarian Universalist Religious Naturalists. He serves on the Unitarian Universalist Association’s Commission on Social Witness and on the UUA President’s Council. He lives in Westport with his wife, Dr. Gail Pesyna, also a scientist and a program director at the Alfred P. Sloan Foundation.

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## EMERGENT FREEDOM

Monday, 2:50–3:50 P.M., Elliot

**James Haag with Terry Deacon**

See abstract and biosketch on page 29.

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## BREAKING THE SELFISH MODEL: EXPLORING THE ORIGINS OF PROSOCIAL BEHAVIOR

Tuesday, 2:50–3:50 P.M., Elliot

**Julie Hui with Terry Deacon**

### ABSTRACT

See abstract and biosketch on page 29.

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## WHAT'S EMERGED FROM EIGHT YEARS OF SCIENCE AND RELIGION DISCUSSION IN HOUSTON, TEXAS

Thursday, 4:00–5:00 P.M., Elliot

**Daniel T. Johnson**

### ABSTRACT

I organized an IRAS-affiliated local Science and Religion Discussion Group in Houston, Texas after attending my first Star Island conference in 1999. The group has met the third Friday evening of each month since January 2000. At the outset, interested participants were reached by contacting IRAS members in southeast Texas, by public service notices in the Houston Chronicle, by a webpage, and by publications of my church congregation, which also provides meeting space. Over time, a core group of regular attendees emerged, and the meeting format has developed with one volunteer preparing a topic to present, often a book review, with lively discussion among the ten or so people present. There's a standing public invitation on the webpage, so new people occasionally show up, and some become regulars. I've kept a record of meeting topics and attendees, and I will present a summary of what's emerged from the eight years of group meetings—a little like a Star Island conference sliced thin.

### BIOSKETCH

Daniel Johnson is a geophysicist in Houston, Texas. He grew up in western Canada, and graduated (twice!) from the University of Alberta, in physics, and in computing (artificial intelligence). He has worked in natural resource exploration and exploitation in the mining and oil industries since 1969, recently with the Exploration and Production Technology Group of BP America and specializing in 4D (time-lapse) seismic techniques. Born in a Lutheran parsonage, he continues in the church as a member of Christ the King Lutheran Church (ELCA), and holds small-o orthodox, small-c catholic views, which make him eager to advance the relationship between science and religion along the lines described by Phil Hefner or John Polkinghorne. Daniel is married to Diane Persson, with two grown children, and has recently become a grandparent. He maintains a

personal website with more information, at:  
<http://persjohn.net/>.

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## INSIDE "AN INCONVENIENT TRUTH" 2.0: THE GLOBAL WARMING SLIDE SHOW, UPDATED

Tuesday, 4:00–5:00 P.M., Newton Front  
*continues* Wednesday, 2:50–3:50pm, Newton Front

**Peter Kelley**

### ABSTRACT

Come see the internationally known slide show on the human causes and predicted impacts of global warming, created by Al Gore and updated since the 2006 movie and the book that won him an Oscar and the Nobel Peace Prize, with new slides not seen in the movie and notes on the training program that has equipped a thousand Americans to present it. It will be delivered by IRAS member Peter Kelley, who received the training along with his father Douglas Kelley (also a Shoaler). Participants will learn some of Gore's own presentation tips and have the opportunity to send feedback to The Climate Project, the Nashville-based program that promotes the slide show and organizes the training. A handout will cover the latest individual, corporate, and governmental solutions that promise to make the biggest difference in slowing global warming. Q&A and discussion will follow.

### BIOSKETCH

Peter Kelley is among the thousand Americans trained by Al Gore to deliver the slide show from "An Inconvenient Truth." He runs a public interest PR firm of eight people in College Park, MD, that encourages the media to cover causes such as clean energy and civil rights. Peter was previously the communications officer for four national environmental groups, and a reporter for Newhouse Newspapers. He represented the National Environmental Trust at the 1997 Kyoto treaty talks on global warming, and was a mentor to the University of Maryland team that built the top US collegiate solar house in 2007. He was a Star Island Pelican in 1976 and 1977, and sang "Blue Suede Shoes" in the talent show.

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## EVOLVING THROUGH WALTZ

Monday and Wednesday, 4:00–5:00 P.M., Brookfield

**R. Kent Koeninger and Jacqueline Schwab**

### ABSTRACT

As you are learning about the emergent evolution of communication, brains, language, and culture, take some time to experience how these transform with live music into an art of effortless and graceful movement. This will be a waltz workshop for any level of dancer, from beginner to experienced and from young to old. Rather than focusing on teaching fancy moves, this workshop will demonstrate how great waltzes emerge when the leader leads the follower as the follower prefers to be led, with two-way active communication.

By keeping the steps simple and changing partners, we will foster a communal experience of creative dance. No prior experience or partner is necessary.

#### BIOSKETCH

Kent Koeninger is an avid folk dancer who teaches the simplicity of waltz in workshops several times per year. When not dancing, he markets supercomputers for HP, which gives him many opportunities for new dance experiences as he travels for work. He has been designing, deploying, or marketing personal computers and supercomputers for thirty years at NASA, Apple, Cray, and now at HP, with a few other stops in-between. He lives in Nashua, NH; St. Louis, MO; and Chilmark, MA.

Jacqueline Schwab is Kent's favorite waltz musician. See biosketch on page 33.

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#### THEISTIC PERSPECTIVES ON EMERGENCE

Monday and Wednesday, 4:00–5:00 P.M., Marshman

**Normand M. Laurendeau**

#### ABSTRACT

Emergence is often viewed solely from within the perspectives of scientific naturalism. Employing John Haught's notion of layered explanations, we explore in this workshop theistic viewpoints concerning emergence, focusing especially on the possibility of underlying purpose in the universe. My plan is simply to facilitate group discussion on the ideas put forth by our invited speakers during this IRAS conference. In this sense, I expect a variable and dynamic interaction based on people's intellectual and emotional responses to salient concepts related to emergence. I would especially encourage discussion concerning mechanisms of emergence, differences among material, efficient, or final causation, and God acting as perhaps a metaphysical or moral exploration of value-laden issues not dealt with by science. In particular, how might that which is considered random or evolving in the scientific realm be compatible with the common good or even with that which is often considered purposeful in the theological realm?

#### BIOSKETCHES

Normand (Norm) Laurendeau is the Bailey Professor Emeritus of Combustion, School of Mechanical Engineering, Purdue University. He has taught in the areas of thermodynamics, chemical kinetics, and engineering ethics. He conducts research in the combustion sciences, with particular emphasis on laser-based diagnostics, pollutant reduction, and energy policy. He has authored or co-authored one textbook, over 175 archival publications, and nearly two-hundred conference presentations. He is a fellow of the Optical Society of America and of the American Society of Mechanical Engineers. He is a fully professed Lay Dominican and also a visiting scholar at the Center for Theology and the Natural Sciences, Graduate Theological Union, Berkeley, CA.

#### STAR '06 AND COMPLEX ADAPTIVE SYSTEMS: AN OVERVIEW

Sunday, 4:00–5:00 P.M., Elliot

**Robert McCue**

#### ABSTRACT

For those of us without extensive scientific training (and even for some of the erudite), the 2006 conference covered a stunning array of ideas. The purpose of this seminar is to provide a conceptual overview of the material presented at the 2006 conference designed for those who did not attend Star '06 or who would like a refresher. The presentation will be made with PowerPoint, using graphic images to help us remember and digest the basics of complexity theory as it applies to complex adaptive systems, such as the ecosystem, the economy, and our brains. Much of the material is summarized in an essay accessible on-line. We will pay special attention to some of 2006's key metaphors, such as Stuart Kauffman's "the edge of chaos" and "adjacent possible"; Loyal Rue's "grunge"; and Terry Deacon's "falling into creativity." Our anchor will be Ursula Goodenough's "covenant with mystery," and the religious or spiritual experience that for most human beings results from beginning to grasp the ungraspable nature of reality's creative font.

#### BIOSKETCH

Bob McCue is a tax attorney in Calgary, Canada. He has a BA (Russian language major; religious studies minor), an MBA, and a law degree. His law practice is oriented toward mergers and acquisitions, public financings, and dispute resolution with Canada's taxation agency. Bob is a science neophyte who struggles to follow conversation while on Star, and so asks lots of questions and takes lots of notes. He then goes home and for months tries to figure out what he heard people talking about. After modest success, he gives up in time to come back to Star the following year. Star 2007's organizers decided to treat the same topic two years running, giving Bob a chance to catch up.

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#### DEVELOPMENT OF OBJECTIVE CRITERIA TO EVALUATE THE STATUS OF 'REVELATION'

Thursday, 4:00–5:00 P.M., Marshman

**Tariq Mustafa**

#### ABSTRACT

All religions claim to be from God in one way or another. Each one feels that they alone are on the right path. There has been much debate but little honest discussion and discourse to get at the objective TRUTH. Revelation is supposed to be of divine origin, but what is the status of authenticity and purity of a particular piece claimed to be revelation? What is its historical validity, state of preservation, and contribution to human welfare? These crucial questions need answering to make the discourse more meaningful and productive. Little attempt has so far been made to improve the focus

of this discourse, no doubt because of the prior allegiances and sensitivities involved.

In this workshop I will endeavor to develop more rational criteria, in consultation with all stake holders, including secular humanists, remaining respectful to the sensitivities involved, for addressing the subject. It is proposed that a fresh, positive, cooperative and nonadversarial approach be tried to move further in this crucial area.

The aim will be to bring more objectivity into this discourse and bring the discussion more on the turf of reason rather than faith and prior allegiance. Instead of debating the merits of each claimed revelation, the proposal is to first develop objective criteria using the methodology of science, which can then become the basis for evaluating the claims of each view point in a rational manner. This should at least set the rules of the game.

#### BIOSKETCH

Tariq Mustafa is an engineer and specialist in space technology whose scholarly pursuit of science, technology, and the universe has taken him to over fifty-five countries. He is a prominent speaker who has been invited to talk internationally on Reason and Revelation through the media of TV and radio as well as to church groups, Rotarians, scientific societies and conferences, the Muslim Education Forum of the UK, and the Asian Study Group. Mr. Mustafa's work on Reason and Revelation is being published next year. His career spans thirty-six years as chairman, senior government official, and diplomat. Having worked closely with NASA, the US Atomic Energy Commission, and the French Aerospace Industry, he established Pakistan's space program, working with the Nobel Laureate, Professor Abdus Salam, and subsequently held positions as Pakistan's Secretary of Defense, Secretary of Science and Technology, and Secretary of Privatization. He also acted as a World Bank Advisor to Pakistan for technology development and Chairman of the Board of Governors of the Asia Pacific Centre for Technology Transfer. He is the current president of Pakistan's National Paralympics Committee and a vice president of the Asian Paralympics Committee.

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#### ECONOMIC EMERGENCE: WHEN IT ALL COMES TOGETHER

Thursday, 2:50–3:50 P.M., Elliot

**Jay Ogilvy with Terry Deacon**

#### ABSTRACT

See description and biosketch on page 30.

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#### CAN POETRY BE A BRIDGE BETWEEN THE CONSCIOUS COGNITIVE AND EMOTIONAL TERMS OF OUR EXPERIENCE, AND THE UNDERLYING PROCESSES WHICH GIVE RISE TO THESE EMERGENT EXPERIENCES?

Sunday and Monday, 4:00–5:00 P.M., Pink Parlor

**Jack Pearce**

#### ABSTRACT

Our consciousness enmeshes us in a world of appearances, emotion, and collectively evolved interpretive terminology. Our experienced world is underlain by processes internal and external to us of which we are not easily aware, and which is laboriously, incrementally delineated in the disciplines we call science. We face the process of reconciling the terms of our personal and group experience with the layered, quantified, architecturally integrated reality behind and beneath it.

Poetry is often considered an expression of emotion and imagination. But it can also be considered a condensed, economic way of delineating the architectural essentials of experience and perception. If one has a sense of architectures underling our experience, one can use the economy and incisiveness of poetic expression to relate those architectures to experience as we perceive and express it.

The workshop moderator would bring to the sessions a set of poems constructed with this objective in mind, solicit from Star Island participants nominations of poems which they consider to be useful in such an undertaking, make a selection of poems to be considered in discussion sessions, and see if poetry can indeed be a bridge between the way we experience our lives and the natural architectures which create and sustain them.

#### BIOSKETCH

Jack Pearce is an attorney and businessman who has maintained an active interest in the sciences throughout his childhood and adult life. He has served with the Antitrust Division of the Department of Justice, the Agency for International Development, and the White House Office of Consumer Affairs. He has also conducted a Washington law practice, and an officing business which grew out of that practice. He has a website — <http://www.pearcesite.net/> — which sets out some views of the nature or order in the universe gleaned from his attention to scholarly work of others. These views underlie the poetry which is also on the website.

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## JESUS AND CREATIVITY: THE EMERGENCE OF CHRISTIAN SUPERNATURALISM AND NATURALISM

Sunday and Tuesday, 4:00–5:00 P.M., Marshman

**Karl Peters**

### ABSTRACT

Can a particular religion such as Christianity be understood as an emergent biohistorical phenomenon? Can central symbols of Christianity such as God and Christ continue to evolve? Can God for Christians be understood non-personally as creativity? Can Jesus as the Christ express a new, naturalistic modality of God that empowers and guides humans in responding to the threats of nuclear and ecological holocausts? In his latest book *Jesus and Creativity* (a sequel to *In the Beginning... Creativity*), Gordon Kaufman says “Yes” to all these questions. This two-part workshop will examine Kaufman’s ideas using my book review (published in *Zygon*, March 2008). Some copies of the review will be available on Star Island.

### BIOSKETCH

Karl Peters is professor emeritus of philosophy and religion at Rollins College, Winter Park, Florida and is coeditor of *Zygon: Journal of Religion and Science*. He has been attending IRAS Star Island Conferences since 1972, and is vice president for conferences and a past president of IRAS. He also is the current president of the Center for Advanced Study in Religion and Science, which is IRAS’s partner in publishing *Zygon*. Karl has a BA degree from Carroll College in Wisconsin, an MDiv from McCormick Seminary in Chicago, and a PhD from Columbia University in New York. For nearly forty years he has taught, lectured, and published on issues in science and religion, with a special interest in understanding how religion and science can be related to everyday living. Many of his reflections are in *Dancing with the Sacred: Evolution, Ecology, and God* (Trinity Press International, 2002) and in *Spiritual Transformations: Science, Religion, and Human Becoming* (Fortress Press, July 1, 2008). The latter book is based on his chapel talks given at the 2005 IRAS conference. He is a member of the Unitarian Society of Hartford. He lives in Granby, CT with his wife, Marj Davis.

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### A PRIMER ON EMERGENCE THEORIES

Monday, 4:00–5:00 P.M., Elliot

**Keith Sawyer**

### ABSTRACT

This workshop will introduce the audience to the basic ways of thinking associated with emergence theories as represented in sociological and philosophical thought over the last several decades. I will describe six characteristics that a sensible theory of emergence must have. Then, I will describe four candidate theories of emergence, each of which have the six characteristics. This simple framework will help the participants to

better learn from, and critically engage in dialogue with, the formal presentations during the week.

### BIOSKETCH

See biosketch under “Social Emergence: Societies as Complex Systems” on page 13.

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### POETRY WORKSHOP (DETAILS TO BE ANNOUNCED)

Tuesday, Wednesday, and Thursday, 4:00–5:00 P.M.,  
Pink Parlor

Bob Schaible

### ABSTRACT

Details to be announced in the Star Beacon

### BIOSKETCH

Bob Schaible is a professor of arts and humanities at the University of Southern Maine. His teaching and scholarship are primarily interdisciplinary in the areas of literature, religion and science. He has served as a consultant or facilitator in a number of programs funded by the NSF and NEH designed to help both secondary and college-level faculty develop curricula that bridge the gap between the sciences and the humanities. He was recently on sabbatical studying the tensions between the university and the political and religious right, and, more specifically, the place for authentic-self teaching (a nuanced form of advocacy teaching) in this context.

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### DON’T PANIC, IT’S ORGANIC: TOWARD A NATURAL HISTORY OF AMBIGUITY, DOUBT, PARADOX, AND TOUGH JUDGMENT CALLS

Wednesday, 2:50–3:50 P.M., Elliot

**Jeremy Sherman with Terry Deacon**

See description and biosketch on page 29.

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### THE NEURAL BASIS OF EMPATHY AND HUMAN MORAL COGNITION

Sunday, 4:00–5:00 P.M., Newton Front  
*continues* Monday, 2:50–3:50 P.M., Newton Front

**William Shoemaker**

### ABSTRACT

Recent recordings from special neurons in cerebral cortex, functional imaging studies, and clinical evidence indicates that a remarkably consistent network of brain regions is involved in empathy and moral cognition. These findings are fostering new interpretations of social behavioral impairments in individuals with brain dysfunction, and require new approaches to enable us to understand the complex links between individuals and society. Based on recent findings in human and monkey brain studies, this workshop will present views on how cultural and context-dependent knowledge, semantic social knowledge and motivational state can be

integrated to explain complex aspects of human moral cognition. The workshop will begin with a brief introduction to brain structure and function in order to provide a common background for discussion.

#### BIOSKETCH

Bill Shoemaker received his PhD from MIT and has held positions at the National Institute of Mental Health, the Salk Institute, and currently at the University of Connecticut Health Center in Farmington, CT. He is in the Psychiatry faculty where he teaches residents and medical students, and in the Neuroscience Graduate Program. Dr. Shoemaker has published more than two-hundred articles and abstracts based on his active research program.

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### MIGHT THE CONVERGENCE OF MULTIPLE "INCONVENIENT TRUTHS" SIGNAL THE EMERGENCE OF DEMOGRAPHIC AND SOCIETAL COLLAPSE?

Tuesday and Wednesday, 4:00–5:00 P.M., Lawrance

**J. Kenneth Smail**

#### ABSTRACT

This year's workshop represents an extension of my Star 2006 presentation entitled "Confronting a Surfeit of People..." I will suggest that an important "emergent" phenomenon has become increasingly likely, namely the growing potential for a global "synchronous failure", a cascading political, economic, social, environmental, and demographic collapse stimulated by the mutually-reinforcing convergence of multiple "inconvenient truths". Chief among these truths are surely: (1) continued unsustainable population growth (a projected nine-plus billion by 2050); (2) the imminent "peaking" of fossil energy resources (oil, gas, and coal); (3) increasing climatic instability (or "global warming"); (4) broad-scale environmental stresses on numerous fronts (water, soil, biodiversity, etc.); (5) a pervasive and hyper-consumptive economic "growthmania"; and (6) political destabilization and social disruption by various "non-state" actors. This poses a fundamental existential

question. Unless significant mitigating steps are soon undertaken, could the future of modern industrial/technological civilization, not to mention the lives of several billion human beings, be at considerable risk?

#### BIOSKETCH

Ken Smail is Professor of Anthropology (Emeritus) at Kenyon College in Gambier, OH. He retired in 2004. His teaching and scholarly interests have centered around physical anthropology and human evolutionary biology broadly-defined (PhD Yale, 1976). His writing and thinking over the past twenty-five years has focused primarily on peace and conflict resolution issues (the "peace hostage" concept) and, more recently, on matters pertaining to global over-population, finite environmental limits, and optimal human carrying capacity.

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### KEN WILBER: WHAT MIGHT HE HAVE TO SAY

AT THIS CONFERENCE?

Sunday, 4:00–5:00 P.M., Lawrance

**Frank Thoms**

#### ABSTRACT

Ken Wilber is the most comprehensive and one of most lucid philosophers of our time. He has written extensively in search of the meaning of the universe and in being human. *A Brief History of Everything* is my favorite of his books. I intend this workshop to be a conversation on Wilber and his remarkable thinking. Come having read Wilber or not — and prepare to ponder why we came to this conference.

#### BIOSKETCH

Frank Thoms, a lifelong teacher, has shared his love of the deeper questions of our existence with eighth graders for much of his career. He has taught them *The Universe Story* based on the ideas of Brian Swimme. He now teaches teachers, reads more than ever, and is writing a book about teaching.

## PIRATE SESSIONS

### ADVANCED EMERGENT DYNAMIC THEORY FOR BEGINNERS: TERRY'S PIRATES EXPLAIN AND APPLY IN PLAIN ENGLISH

Long-time IRAS member and this year's co-convenor, Terry Deacon often attracts a porch crowd\* as he attempts to explain the ideas that he and colleagues have been developing over the past decade—ideas about how matter ever becomes mattering, how energy becomes information, how evolution ever gets started, and how to accurately integrate evolution and self-organization to explain consciousness. In afternoon sessions this year the Pirates—his colleagues back in Berkeley—will take turns providing clear and easy summaries of the core concepts in Emergent Dynamics Theory and showing how they can be applied productively to key philosophical, spiritual, and practical matters.

Each session will include a Pirate's mercifully short and accessible presentation outlining a piece of the theory and applying it, followed by questions and conversation. Come to any or all. You'll come away with a much better sense of what the fuss is all about.

All the sessions are held from 2:50–3:50 P.M. in Eliot.

\*As another long time IRAS member Jeff Dahms puts it, IRAS/Star has its own peculiar branch of soteriology—the branch of theology that deals with salvation. Here, it's "So Terry, how does...?"

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#### SUNDAY

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#### FOUNDATION STONES

**Tyrone Cashman**

#### ABSTRACT

Speaking to a group of young people recently, I tried to explain the predicament of their future with the metaphor, "This civilization is slipping off its foundations." A new high-school graduate asked me, "What are the foundations of a civilization?" I heard myself answer, "philosophical principles." The philosophic foundation of Western civilization has had a crack in it, from as far back as history provides records. The Great Crack is revealed in our answer to the question, Where does all value reside?

For the last 3,000 years the response has been: In a Divine Mind off-planet and/or in the human mind alone, on-planet. G.E. Moore's fact/value split is a recent articulation of it, and C.P. Snow's "two cultures" of science and the humanities (+ religion) are its societal manifestation.

The world is waking up to the fact that a civilization based on such a theory of value will not stand. The climate will destabilize and the complex ecosystems that support human life will die.

We have (modestly) proposed to outline a set of new foundational principles for either the present 'recovering' civilization or, failing that, for some later civilization. These principles can depend neither on faith nor on unexplained homunculi. We propose to begin again, at the bottom, and to show, step by step, how mind emerges from molecular matter and how value is generated from within the natural world. The principles

we propose, although philosophical, are now able to be scientifically grounded.

We accept the universal dynamism of Heraclitus and Gautama, but we also show how Parmenides and Plato had insights that require some explanation. Ours, of course, are different from theirs. While admitting to ultimate dynamism, our theory shows that there is no need to capitulate to a radical relativism of value. Our theory takes a new long look at the nature of form (especially dynamic form), the constraint that comes from form, and the role of formal constraint in the emergence of new properties and capacities. This examination has led to a better understanding of self-organizing processes in nature and revealed the much wider role they play in evolution than has been understood. Some of our principles have to do with general dynamic topologies, recursive dynamics, and reciprocal countervailing self-organizing processes leading to ratcheted ontological levels that temporarily prevent the slide into maximum entropy. The intimate partnership that has developed between these constrained self-organizing dynamics and the radical creativity of selection dynamics is at the root of both information and teleology.

The Great Crack was partly driven by a philosophical assumption formulated in the Middle Ages: "Nothing gives what it doesn't have." Concepts of immaterial substance have been employed over millennia as explanations of unusual phenomena, especially those related to cognition. We step outside the frame of substantialism with a newly careful examination of the experience of *absence* and its surprising role in function and cognition.

#### BIOSKETCH

- Eight years training for priesthood in Jesuit Order.

- Ph.D. in philosophy of science, Columbia.
- Have taught and lectured in 17 colleges and universities.
- Spent the '70s developing wind energy industries.
- Spent the '80s studying Zen Buddhism.
- Spent the '90s developing solar energy policy in Japan.
- In this decade have worked closely with Terry Deacon and colleagues on issues in the interstices of science, philosophy and religion, a work to which I committed myself at age 24.

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MONDAY

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EMERGENT FREEDOM

**James Haag**

ABSTRACT

This workshop presents material derived from James' recent dissertation. *Emergentism*, by expanding our notions of causation, provides a space for free will to be both experientially balanced and evidentially accurate. The key issue in the free-will debate is this: Experience dictates that our ideas and decisions lead to certain actions that we carry out. Unfortunately, among scientists and philosophers, the dominant perspective on causation is that efficient causation is the only legitimate option. My claim is that accepting this efficient-causation-alone view means losing the possibility for human free will. Both popular views—compatibilism and incompatibilism—fail to account for a version of free will that aligns with both experience and evidence. However, emergentism offers a novel position from which to assess free will. By exploring the popular and controversial "Libet Experiments" that purportedly show the impossibility of free will, I will offer an alternative interpretation based on the dynamics of emergence.

BIOSKETCH

**James Haag** finished his Ph.D. in systematic and philosophical theology at the Graduate Theological Union in 2007. In the Fall, he will be senior lecturer of philosophy at Suffolk University in Boston. His dissertation will be published by Vandenhoeck & Ruprecht in early 2009 with the title *Emergent Freedom: Naturalizing Free Will*. He is currently the managing editor of the journal *Theology and Science*.

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TUESDAY

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BREAKING THE SELFISH MODEL: Exploring the origins of prosocial behavior

**Julie Hui**

ABSTRACT

For nearly 150 years, Darwin's theory of natural selection has had a thorn in its side, which can be formulated thus: If natural selection is "red in tooth and

claw," then how is it that there is so much cooperation in the world? Darwin found this troubling in ants and bees, and not merely among humans. The last fifty years has seen an influx of explanations for how selection on a group-level can be maintained through natural selection. This work has been fruitful in demonstrating under what conditions prosocial behavior would be evolutionarily stable, but ignores the difficult problem of how species might shift away from selfish strategies in the first place. This workshop explores the use of the distributed selection theories of Terry Deacon. It will begin with a whirlwind tour of current understandings of the distinction between altruistic and prosocial behavior, and will proceed to the more challenging topic of incorporating Deacon's approach, presenting a thought experiment that simulates distributed selection on a variant of the mushroom world computer simulations.

BIOSKETCH

Julie Hui is a biological anthropology PhD student at the University of California at Berkeley. Her research interests revolve around the use of computer simulations to explore plausible explanations for the origins of integrated systems.

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WEDNESDAY

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DON'T PANIC, IT'S ORGANIC: Toward a natural history of ambiguity, doubt, paradox, and tough judgment calls

**Jeremy Sherman**

ABSTRACT

We're creatures of habit except when a groove starts to feel like a rut. Then we wonder what to do, facing tough judgment calls about what we can and can't change, whether to hold or fold, and even whether to doubt at all. Sometimes we feel like unnatural idiots for not being better at deciding -- aberrant creatures who somehow fell from grace, unlike normal competent creatures.

We didn't fall from grace; we rose from slime. Indeed all of life makes tough judgment calls in the face of uncertainty. Even in the autocell—the precursor to life and evolvability hypothesized in the Emergent Dynamic Theory—we find the origin of tough judgment calls, the first instance in which matter becomes mattering, and mattering means attempting to take the better path at a fork in the road.

In this workshop, Jeremy Sherman will take us on a quick survey starting with the autocell and ending with the tough decision you have to make next week. You'll come away with a new approach to sustainable serenity (don't panic, doubt is organic) and perhaps new questions about religion's various explanations of human imperfection.

BIOSKETCH

Jeremy Sherman, Ph.D. (evolutionary epistemology), M.P.P. (public policy), has been a student/colleague of

Terry Deacon for 12 years. For the past 5 years he has produced a weekly article, blog, podcast ([www.mindreadersdictionary.com](http://www.mindreadersdictionary.com)) interpreting and applying Terry's work and his own insights to everyday life. He and Terry have a new academic blog/podcast at [www.teleodynamics.com](http://www.teleodynamics.com). Jeremy teaches 20–30 hours a week at Expressions College for the Digital Arts in Emeryville, CA, lecturing on what he calls his "midlife spread"—psychology, sociology, evolutionary theory, cultural studies, Western Civ., philosophy, economics, marketing, and English, with a primary interest in how to impart pragmatic wisdom—rhetoric, critical thinking, and moral philosophy—as efficiently and enduringly as possible to fresh minds. Jeremy plays bass and sings, figging (figments of gigs—small venues) three to five times a week. He has three children, the youngest of whom, Lucy, brings him great joy in general and by being here with us this week. Spiritually, Jeremy is a Taowinist (Tao+Darwin).

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THURSDAY

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ECONOMIC EMERGENCE: WHEN IT ALL  
COMES TOGETHER

Jay Ogilvy

ABSTRACT

Jay Ogilvy will apply the logic of the autocell—the containment of mutual processes of autocatalysis—to the emergence of wealth in Silicon Valley. He will set this example in the context of describing eight traits of several different emergent systems: (1) no first instance, e.g., no first word in a language (since there must be many words for any sound to *be* a word); (2) emergent systems *pop*, because (3) they come into being all-of-a-piece (holism); (4) recursivity; (5) emergence is usually unanticipated or counterintuitive (not quite the same as unpredictable); (6) irreducibility; (7) desire

(teleodynamics); (8) collapse, sleep, death: Whatsoever comes together can come apart.

In 2001 he started work on a book whose working title is *Coming Together: How the emergence of life, love, and language shed light on the nature of consciousness*. Many agree with the proposition, "Consciousness is an emergent property of the brain." Agreement is easy because people don't really know what they mean by 'emergent.' The strategy of this book is to beat about several neighboring bushes—life, evolution, love, and language—before returning to address the problem of consciousness with a new fluency in the language of emergence. How are the eight traits exhibited in these other realms? And what do we learn there that can illuminate consciousness?

BIOSKETCH

Jay Ogilvy received his PhD in philosophy from Yale in 1968. He taught philosophy at Yale from 1967–1974, then at Williams College from 1975–79. After working at SRI International (formerly Stanford Research Institute) from 1979–86, he co-founded Global Business Network in 1987 with Peter Schwartz and Stewart Brand. Together with his colleagues in GBN, he practices long-range strategic consulting for corporations and government agencies. His interest in emergence began with reading C. Lloyd Morgan as an undergraduate in the 1960s, then publishing an SRI monograph in 1979, "The Emergent Paradigm." After writing half a book on the subject in 2001, he discovered Terry Deacon's work and, since 2003, has been meeting with Terry and his colleagues while refashioning his still incomplete book. He is the author of *Many Dimensional Man* (Oxford U. Press, 1977); *Living Without a Goal* (Doubleday, 1995); *Creating Better Futures* (Oxford, 2001); editor of *Self and World* (Harcourt Brace Jovanovich, 1970; 1981); and *Re-Visioning Philosophy* (SUNY Press, 1991).

## OTHER ACTIVITIES

### ART BARN

Every day from Sunday through Thursday,  
2:00–3:30 P.M. and 3:30–5:00 P.M., in the Art Barn

**Katherine Baucke**

#### DESCRIPTION

Katy Baucke returns to IRAS at Star Island this year to share her fascination with word and image in the Art Barn. All are most welcome to come and sketch, draw, or paint, independently or joining others in a quest to make art.

For the more serious at heart, Katy will introduce images never before available to us, as well as emerging language forms. Not only drawing on the beautiful landscape of Star Island, we will also be looking at “new landscapes” generated by computer data, map forms, energetic and cosmic images. Using various art materials, we will explore combining the emergence of “new language and new landscapes” into visual poetry.

Basic art materials will be provided for the workshop, but bring your own too! Participants are encouraged to attend the first day and *most* of the workshop days, which will culminate in a Friday Opening and Exhibition.

### BIOSKETCH

Katy Baucke, a regular at IRAS for the last 5 years, brings with her more than 30 years of experience working in both the academic and *not-so* academic field of the visual arts. She is a freelance artist, living and working in Portsmouth, NH.

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### MORNING YOGA AND MEDITATION

Every day from Sunday through Friday,  
6:30–7:45 A.M. in Brookfield

**Sandra Woodworth**

#### DESCRIPTION

Begin your day with gentle flow-style Hatha Yoga. First we will do a 50 minute sequence to awaken the body and prepare for an optional 20 minute meditation.

Each class provides a meditative breathing practice and balanced workout that will strengthen muscles, release tensions, calm minds, and nurture spirits. Beginners are always welcome and are encouraged to work each posture at the optimum level where release is happening without strain. Mats are available.

### BIOSKETCH

See Sandra Woodworth on page 8.

## CHAPEL AND CANDLELIGHT SERVICES AND CHOIR

Activities of the day begin right after breakfast each morning with chapel. Scheduled activities of the day end with a candlelight service.

### CHAPEL SERVICES

9–9:45 A.M.

#### EMERSON'S EMERGENT EPIPHANY

During the chapel talks each morning, Edmund Robinson will present worship designed to give the participant an experience of emergence. The following are possible themes for the services: "the bottom-up God," "the emergence of personhood," "grace as an emergent property," and "is monism a myth?"

**Edmund Robinson** is the newly settled minister at the Unitarian Universalist Meetinghouse of Chatham, MA. He was ordained into the Unitarian Universalist ministry in 1999, after a career as a trial lawyer in Charleston, SC and Boston, and has served churches in Wakefield, MA, Belmont, MA, and Staten Island NY. He has been a member of IRAS since 1997. He is married to pianist Jacqueline Schwab, who will be with us on the island, and has two grown children by a previous marriage. He cannot keep from singing: he plays fiddle, banjo and concertina and leads singalongs at happy hour.

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### CANDLELIGHT SERVICES

9:40–10:00 P.M.

To attend a candlelight service, line up on the front porch after the evening session, take a lantern, and walk in silence to the chapel.

Each candlelight service will begin with a short reading chosen and read by one of the "young adult" cohort of our conference. Jessica Goodenough Heuser, soprano, and Elliot Figg, keyboardist, will then perform an ~15-minute program of music chosen largely from the baroque/prebaroque era, followed by a few minutes of silent reflection, followed by a closing reading. Readers will include Whitney Bauman, Elizabeth Ingethron, Lydia Laurenson, Braden McCue, and Ruth (Bunny) Orme-Johnson.

**Elliot Figg** (b. 1979), keyboardist and composer, is a native of Dallas, where he began studying piano at age 9. Through his teenage years he studied piano with Jo Boatright, founder of the Dallas contemporary music ensemble Voices of Change. Elliot's work *Metropolitan Malady* was performed by the group, including Dallas Symphony concertmaster Emanuel Borok and first cellist Christopher Adkins, in 1994. Elliot received bachelor's and master's degrees in music composition from the University of North Texas in 2002 and 2008, respectively. While at UNT he studied composition with Cindy McTee and Joseph Klein and harpsichord with Lenora McCroskey. He

frequently performs in the Dallas/Fort Worth area and elsewhere as harpsichordist and pianist. Elliot's most recent compositional projects aim to combine Baroque performance practice techniques with altered tuning systems and modern musical approaches. His first work in this vein, *Sonate für Violine und Generalbaß*, was performed at the Boston Early Music Festival in 2005. His last work, *And Music Shall Untune the Sky*, was written for and recorded by Metropolitan Opera tenor Richard Croft, who appeared last season as Gandhi in Phillip Glass's *Satyagraha* at the Met.

**Jessica Goodenough Heuser** (b. 1980) started singing before she realized what she was doing. Her voice retains an effortless quality despite her years of study. She majored in vocal performance at Washington University in St. Louis and briefly chased a Master's Degree in musicology at the University of North Texas before discovering that she was not interested in musicology. Professional venues include frequent solo performances with the Kingsbury Music Ensemble and with the American Kantorei in St. Louis. She is currently soprano soloist at St. Mark's Episcopal Church in Venice FL. Following Star Island, she will travel to Toulouse, France, to be soloist with the Musique Ancienne aux Pays des Gazes.

While attending UNT, she met the incomparable Mr. Elliott Figg, asked him to be her accompanist, and paid him in martinis. When she is not singing in a church of some denomination, she is either singing in the street or sailing on her new sailboat with her partner Josh and her dog Oscar.

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### THE IRAS CHOIR

The IRAS Choir meets to rehearse Sunday through Friday immediately after lunch in the Pink Parlor [off the main lobby] and as otherwise announced. The choir is a lively and enthusiastic group of conferees, and looks forward to preparing music for the closing banquet, the talent show, and a chapel service. All singers are warmly encouraged! Accomplished instrumentalists are welcomed with open arms! Speak to Jane Penfield if you are interested but have doubts, and she will persuade you that they are misplaced.

**Jane Penfield** is workplace giving manager at the Greater Hartford Arts Council. She also directs the youth choir at St John's Episcopal Church, West Hartford. She studied music at Mount Holyoke College (BA, 1976) and choral conducting at The Hartt School (MM, 1993).

## SPECIAL PIANO CONCERT

Friday, 4 PM, Main Lobby

Jacqueline Schwab will offer a one-hour concert of her repertoire to capstone the week

**Jacqueline Schwab** is a folk and classical improvisational pianist who plays “gorgeously spare piano” (*The Boston Globe*) yet “sounds as if she has an orchestra at her fingertips” (*Sing Out*). Chosen by Ken Burns for numerous public television documentaries due to the emotional expression in her playing, Jacqueline has performed on the soundtracks for the Grammy award-winning *Civil War*, the Emmy award-winning *Baseball* and *Mark Twain*, among others. She has performed at the White House for President Clinton in 1997 to celebrate Burns’ *Lewis and Clark* series and also at the Smithsonian in 2000 to celebrate its exhibition on the Presidency. Jacqueline’s signature style defies easy categorization, fitting somewhere in the crossover between folk, traditional, classical and new age music. Although many people connect improvisation with jazz, Jacqueline’s inspirations are traditional music of England, Scotland, Ireland, and America, blues, vintage tangos, Bach’s dance suites, nineteenth-century parlor piano, and the turn-of-the-twentieth-century sounds of Satie, Debussy and Bartok for starters. In the unique Third Stream program at New England Conservatory of Music, from which Jacqueline received a Bachelor of Music degree with honors, she was encouraged to meld different musical traditions into a personal style. She has “... an uncanny sensitivity to the moods and proprieties of music from other eras,” wrote *New England Folk Almanac* reviewer Scott Alarik. Jacqueline’s solo recording *Mark Twain’s America - A Portrait in Music* (on Dorian) recreates the sounds of nineteenth-century American parlor music – Stephen Foster and Civil War songs, hymns, spirituals, and ballroom dances. Columnist Eric Zorn, of the *Chicago Tribune*, wrote that he had it “going non-stop on the

stereo.” Schwab’s *Down Came an Angel* (also on Dorian) features meditations on American Christmas music, including unusual Appalachian carols and South Carolina sea island spirituals. *Mad Robin*, her first solo recording, contains lyrical reflections on English dance tunes, mood music for dancers and nondancers alike. Jacqueline performs solo piano concerts of vintage American and traditional English and Scottish music, creating the intimate feeling of an old-fashioned parlor setting. Although many are familiar with the elegiac qualities in Jacqueline’s soundtrack work, some have also experienced her music’s more rousing side. Jacqueline has toured the United States and England, inspiring people on the country dance floor through her performances with the Bare Necessities group and as a dance caller. She grew up (or tried to) dancing international folkdances and singing Israeli and Balkan songs, before turning her attention to English, Scottish, Irish and American traditional music. Now she enjoys sharing that knowledge by teaching workshops on dance music and improvisation. Jacqueline has performed and recorded with many traditional and folk musicians, among them Scottish fiddler Laura Risk, singer Jean Redpath (on *A Prairie Home Companion*), fiddler Alasdair Fraser, cellist Abby Newton, glass harmonica player Dean Shostak, fiddler Andrea Hoag, singer-songwriter Dillon Bustin, and singer Jeanne Morrill. For her work with Ken Burns, she has also collaborated with fiddler Jay Ungar, bassist and guitarist Molly Mason, fiddler Matt Glaser, whistle player L.E. McCullough and others. She has played on over forty recordings. She is married to Edmund Robinson, our chapel speaker, who is an avid concertina and banjo player. She will also be accompanying Kent Koeninger’s waltz workshops.

# PEOPLE

## Conference Planning Committee

Phillip Clayton	Cochair
Terrence Deacon	Cochair
Ursula Goodenough	Cochair
Nancy Anschuetz, Jeffrey Dahms, George Fisher,	
Ted Laurenson, Barbara Smuts	

## Conference Administrators

Conference Coordinator	Nancy Anschuetz
Registrar	Bonnie Falla
Registrar Assistant	Doug Burton

## Conference Facilitators

Announcements	Nancy Anschuetz
Bookstore Order	Ursula Goodenough
Candlelight Coordinator	Ursula Goodenough
Children's Program Coordinator	Sandra Woodworth
IRAS Seminar	Stacey Ake, Bob McCue
Memorial Service	Ursula Goodenough
Music Director	Jane Penfield
Program Book (Orange Book)	David Klotz
Social Hour Coordinator	Veronique Blanchard
Star Beacon Editor	Jane Bengtson
Talent Show	Joan Hunter
Workshop Coordinator	Andrew Millard

Many other facilitators are recruited on the Island. A more complete list will be prepared for the banquet program pamphlet. The successful functioning of the conference is utterly dependent on the facilitators. If you would like to become involved in the functioning of the conference and meet and work with new and old friends, the conference chairpersons and coordinator, choir director, and *Star Beacon* editor and production manager would love to hear from you.

## Scholars and Fellows

IRAS Scholars	Paul Cassell
	Julie Hui
	Elizabeth Ingenthron
Griswold Scholar	E Maynard Moore
Sturges Music Fellows	Elliot Figg
	Jessica Goodenough Heuser

## IRAS Officers

John Teske	President
Michael Cavanaugh	Immediate Past President
(open)	Vice President, Religion
Solomon Katz	Vice President, Science
Willem Drees	Vice President, Interdisciplinary Affairs
Karl Peters	Vice President, Conferences
Ursula Goodenough	Vice President, Development
Edwin C. Laurenson	Secretary
Marion Griswold	Treasurer

## Elected Council Members

Stacey Ake	Sol Katz
Muriel Blaisdell	David Klotz
Donald Braxton	Sehdev Kumar
Christopher Corbally	Andrew Millard
Jack Dennis	Carol Orme-Johnson
Willem Drees	Lyman Page
George Fisher	

## Other Council Members (Ex Officio)

Philip Hefner	Zygon Editor
Karl Peters	CASIRAS Representative
Nancy Anschuetz	Conference Coordinator

## Others with Official Responsibilities

Marjorie Davis	Historian / Parliamentarian
David Klotz	Membership Coordinator
Jack Dennis	Newsletter Editor
David Klotz	Newsletter Production Manager
Don Braxton	Webmaster

## Honorary Officers

Donald Harrington	Honorary Vice President
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Long-Range Conf. Planning	Karl Peters
Membership	David Klotz
Newsletter	Ted Laurenson
Nominating	Jane Penfield
Publicity	Marlene Laurendeau
Scholarship	William Falla

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We are also thankful for our conferees, those who coordinate and volunteer for particular activities and all who participate in so many ways. We appreciate all the wonderful ideas and suggestions contributed, both those we were able to incorporate into the conference and those we could not.

We express our appreciation to the Star Island staff for the competent, courteous, and efficient way they take care of our needs and help make our week on the Island so rewarding. Special thanks also to the Star Island Corporation staff for all they do to keep this splendid facility available for our conference.