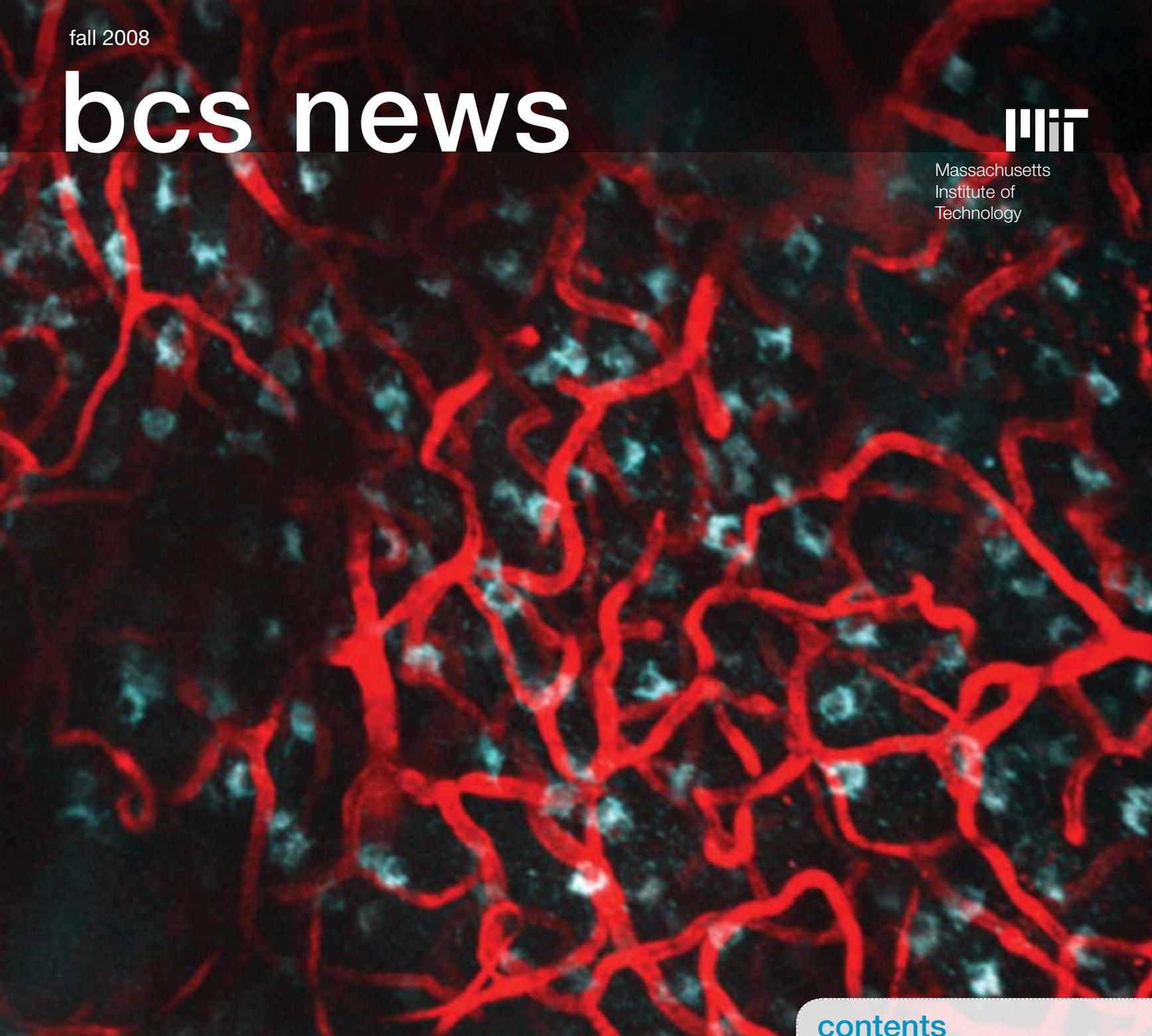


fall 2008

# bcS news



Massachusetts  
Institute of  
Technology



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brain+cognitive sciences

## A Message from the Department Head Mriganka Sur



One of our first efforts will be to establish a significantly enhanced foundation for the department's educational mission

**I am, perhaps, more surprised than many of you to find myself writing another message for the BCS newsletter.** After much discussion and thinking, I agreed to take on a third term as Department Head beginning in July of this year. This was not a decision made lightly and was based in large measure on the encouragement of many of the faculty in the department as well as the desire to see a number of important efforts through to conclusion. I will therefore make use of these few words to tell you about two matters that are of crucial importance to BCS and that will have the highest focus in the early years of this new term.

The first effort that we have undertaken is to establish a significantly enhanced—and permanent—foundation for the department's educational mission. One of the first points of discussion in planning for a third term was bringing more faculty resources to bear in the governance and development of the Course 9 undergraduate major and the BCS graduate program.

I am very pleased to tell you, therefore, that Professor Matthew Wilson has agreed to join the BCS leadership as Associate Department Head for Education. Matt brings extensive experience and energy to this new role, having been for many years one of our best-regarded teachers and also, more recently, the chair of the BCS graduate program.

And Matt has certainly hit the ground running. In the last few weeks, he has established a new Education Committee, conducted initial meetings, and has sought faculty approval for and implemented a number of important changes. Given the traction that this committee has already attained, I have no doubt that there will be a steady drumbeat of improvements in graduate and undergraduate education.

One particularly exciting development is a new joint program in molecular and cellular neuroscience that will allow graduate students in BCS and Biology to move freely across department boundaries to work in the lab for which they are best suited. Thanks are due to faculty member Troy Littleton and Associate Dean of Science Hazel Sive for their leadership and support of this effort. With this program in place, MIT will be able to offer an even greater range of opportunities to incoming students in this area, thereby greatly enhancing our competitiveness.

Another key focus will be to expand our resource development efforts. Over the years, you have read in this newsletter of our increasingly successful research programs in disorders and diseases of the brain. These programs, which collectively we term the Brain Disorders Initiative, have attracted a lot of attention and, importantly, much direct support for this important research. I expect that the Brain Disorders Initiative will continue to grow and become a central organizing theme in the department's research across levels of analysis.

More recently, BCS faculty members Josh Tenenbaum and Tomaso Poggio, in conjunction with colleagues throughout MIT, have advanced a proposal that would bring together researchers in a number of related fields under a new effort termed the Intelligence Initiative. Do take a few minutes to read the article on I<sup>2</sup> elsewhere in this newsletter; I think you will find its mission an exciting new way to bring recent discoveries in cognitive science and neuroscience to bear on next-generation advances in artificial intelligence. It also represents an example of the leading-edge thinking that continues to characterize our department. ■

#### Editorial Board

John Armstrong  
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Ki Goosens  
Ann Olson  
Judith Rauchwarger  
Pawan Sinha

#### Additional Writing

Deborah Halber

Please keep  
in touch:

[bc\\_news@mit.edu](mailto:bc_news@mit.edu)

#### On the Cover

2 photon microscopy reveals the structure of a zebra finch brain nucleus. Blood vessels are labeled with sulforhodamine (red) and neurons with Fast Blue fluorescent dye.

Image by Benjamin Scott, Lois Lab and Tim Gardner, Fee Lab



Pawan Sinha

## Intelligence Initiative to Link BCS, Other Departments in Common Purpose

**What is intelligence?** Books have been written about it; great minds have puzzled over it; philosophers have wrestled with this question for centuries.

An Intelligence Initiative (I<sup>2</sup>) at MIT incorporating faculty across the Institute's five schools whose work bears on the nature of intelligence—in humans or animals, in machines or molecules, in cultural or collective settings—would bring a formidable amount of brainpower to bear on this question, said Tomaso A. Poggio, Eugene McDermott Professor in the Brain Sciences.

The goal would be to bring together researchers in different schools and disciplines at MIT who share the common goals of understanding the nature of intelligence and developing tools to elucidate it; how the brain generates it, and how it could be replicated in machines.

"This is an idea people around the Institute are interested in," Poggio said. "For me, what was originally exciting about such an initiative was the realization that neuroscience is at the point at which it is very useful to other fields, such as computer science, and especially artificial intelligence."

This excitement is at the heart of a larger convergence of ideas and goals across many disciplines, blurring boundaries between biological and physical sciences, social and behavioral sciences, mathematics and engineering, said Joshua B. Tenenbaum, Associate Professor in BCS. For instance, new imaging technologies are bridging the gap between purely behavioral studies of cognition and modern neuroscience. Mathematical techniques that originated in AI, such as probabilistic reasoning in belief networks and statistical learning theory, have become key tools for modeling the mind and brain. Conversely, computational models of biological intelligence are leading to new systems for machine

intelligence. A model of the brain's visual system developed by the Poggio laboratory to mimic properties of neurons in the cortex, for instance, turned out to be as good as state-of-the-art computer-vision systems at recognizing complex scenes. Models of how human children discover and organize systems of concepts, developed in the Tenenbaum laboratory, have led to new algorithms for unsupervised machine learning that advance the state of the art in AI.

### Researchers working on cognition and intelligence have much to gain by interacting with each other and with BCS

"Recent progress in biology, engineering, mathematics, statistics and the social sciences make this perhaps the most exciting time ever to be studying the mind," said BCS Associate Professor Pawan Sinha. "On the biological side, neuroscience and genetics are generating new tools at a rapid pace, yielding new insights into cognitive structure, function, and development that we could not have imagined a decade ago. MIT is unquestionably a world leader in these biological approaches to studying the mind, but what makes MIT unique comes from the contributions of a dozen distinct disciplines and their potential for fruitful interaction."

Just as a critical mass of researchers make up the MIT Energy Initiative—an Institute-wide effort to help ►

continued from p.03

transform the global energy system—MIT has diverse resources throughout the Institute tackling questions surrounding intelligence.

“Researchers across the institute who might not think of themselves primarily as ‘cognitive scientists’ do critical work related to the larger questions of cognition and intelligence,” said Tenenbaum. These faculty and students have much to gain and much to offer by interacting with each other and with BCS faculty studying intelligence, across departmental and school lines.

In addition to some twenty faculty in BCS who study intelligence from cognitive, computational or neural perspectives, MIT research focuses on intelligence across many other units of the Institute, including the Computer Science and Artificial Intelligence Laboratory, the Sloan School of Management, the Media Lab, the departments of Electrical Engineering and Computer Science; Mechanical Engineering; Biological Engineering; Economics; Linguistics and Philosophy; Political Science; Biology; Mathematics and Physics; the Science, Technology and Society program, and the Computational and Systems Biology initiative.



Research under way at MIT includes major efforts on:

#### Visual perception

How does the mind perceive its physical surroundings from visual input, and how can human-like machine vision systems be based on these principles? BCS researchers, electrical engineers and computer scientists work together on models of attention and scene perception; surface perception; style and content factors in perception; and computational models for studying the neural circuits underlying object recognition.

#### Motor control

How does the brain control movements and learn to do so? Consider practicing how to hit a tennis ball. Having learned to play a specific shot, you must then be able to use it under novel conditions—adapting to changes in the spin on the incoming ball, the speed and direction of your opponent’s

shots, and the position of your body with respect to the ball. The study of behavior has a long tradition at MIT of collaborations across the School of Science and the School of Engineering.

#### Mathematics of learning and inference

MIT researchers across multiple schools are working on fundamental mathematical principles of learning from data

and inference under uncertainty. Through collaborations, these researchers could potentially apply methods from one discipline to basic learning problems explored in other disciplines.

#### Memory and its use in everyday reasoning

How is human common-sense knowledge about the physical and social world organized in memory and processed in everyday reasoning to make plausible inferences rapidly and seemingly effortlessly? How can we endow machines with these same capacities? Researchers in several laboratories are studying the structure, organization and efficient processing of knowledge.

#### Language structure and acquisition

How is human knowledge of language structured and acquired, and how can we build computer systems with human-like language capacities? What knowledge is or must be built in a priori, and what knowledge is or can be learned from natural language data? What aspects of linguistic knowledge are shared with other cognitive domains or other non-human species? MIT researchers are working on these central questions, which can be asked about all aspects of language, including phonology, morphology, syntax, semantics, and pragmatics.

#### Social cognition and moral judgment

How do we understand the behavior of other people in terms of the mental states—the beliefs, desires, plans, values, feelings—that give rise to their behavior? How do we judge the moral status of actions that one person takes towards another, or decide what course of action is best in morally ambiguous situations? These questions represent some of the most exciting current directions in cross-disciplinary cognitive science and EECS, philosophy and Sloan.

The growth of computing and networking has launched the field of “collective intelligence” in social systems. Phenomena of collective intelligence and social networking are becoming increasingly important in shaping public access to information, culture, healthcare, government and politics.

#### Intelligent hardware

What circuit-level properties of the brain are responsible for the astonishing combination of speed and accuracy seen in human perception and cognition? Are there general principles of hardware design that might underlie biological and artificial intelligence, and that could lead to more efficient and scalable learning and inference circuits for AI? To what extent can adaptive processes in biology at the cellular and molecular level be described as “intelligent” and characterized in computational terms? MIT researchers studying cognition and intelligence in hardware include those in BCS, EECS, the Media Lab, Biology and Physics. ■

“Neuroscience is at the point at which it is very useful to other fields”

—Tomaso Poggio



2008 league champion Straw Dogs. From l to r: (standing) Mike Long, Tim Buschman, Reuben Goodman, Cal Perez, Oliver Hinds, Brian DePasquale, Retsina Meyer, Chris Moore, John Armstrong, Jefferson Roy, Alexis Bradshaw, Najib Majaj (kneeling/lying) Sam Cooke, Jason Cromer, Hayami Arakawa, Kristin MacCully, Jenn Cromer.

## BCS Straw Dogs Complete Dominating Season, Win League Championship

If you ask **BCS Associate Professor Chris Moore**, winning the league championship is just the cherry on the sundae. “It is very simple,” he says enthusiastically, “the Straw Dogs are all about community.”

His enthusiasm for spending time with members of all factions of the department does not change the fact that the BCS Straw Dogs won their division in MIT’s summer softball league. The team dominated the regular season with a record of 9-1, and the final game against the Biohazards had both players and spectators biting their nails until the very end. Down three runs after the first inning, they managed to make it to the final inning up by the same amount. That is when the game got really interesting. “It was just a series of bad breaks for us that the Biohazards crawled back and tied the game in the top of the final inning,” says Moore who has played with the team since its inception four years ago.

The Dogs had one final chance to take home the championship in the bottom of the last inning. The defining moment came when, after two outs, the bases were loaded, and Gabrieli lab post-doc Oliver Hinds—one of the team’s strongest hitters—was up at bat. Hearts sank when he hit a ground ball right to the opposing team’s player, but rose again as the throw to second was off the mark and Tim Buschman ran home to score the walk-off run and the win.

This season, the team was captained by Jason Cromer, a postdoc in the Miller lab. When asked about what made this year special, Chris Moore highlights Cromer’s leadership and coaching as key elements in the team’s improved playing. “Not only were we having fun,” he says, describing the beginning of the season, “we were getting better.”

John Armstrong, Administrative Officer in BCS headquarters, seconds this. “Jason put together a balanced lineup that really worked,” he says. “The team demonstrated good form right from the beginning of the season, with strong offense all through the order, an excellent infield, and an outfield that stole a lot of runs from the opposing teams.”

Successes aside, the members of the team value the camaraderie and satisfaction of playing together above all else. “We could be 0-11,” says Moore, “and we would still have that.” He credits, in part, the team’s commitment to enjoying themselves to John Armstrong, who managed the team in its second year. Armstrong made everyone sign a contract agreeing to go out for social time as a team after each game.

What sets this team apart from others is its sense of inclusion. The players are students, faculty, staff and **continued on back cover ▶**

### New Beginnings

Prof. **Ted Gibson** and Postdoctoral Associate **Evelina Fedorenko** are to be married on October 25, 2008.

**Lee Mavros**, Coordinator of the Simons Program, and **Christopher Rushton** were engaged on May 19, 2007. They are planning a spring 2009 wedding in Hanover, Pennsylvania.

Administrative Assistant **Michelle Potak** and **David Lahey** were married on September 27, 2008.

Professor **Laura Schulz** and partner **Sue Kaufman** welcomed daughter **Adele Rosalie Kaufman-Schulz**, born on November 18th.

**Isabella Gabrieli** was born on May 28th to father, **Professor John Gabrieli**, mother Research Scientist **Susan Whitfield-Gabrieli**, and big sister, **Christina**.

Graduate student **Sally Kwok** married **Edmond Lee** (a Google employee) on December 28, 2007 on the Big Island of Hawaii.

Postdoctoral Associate **Mehmet Cansev** and his wife **Asuman** welcomed their second daughter **Sedef** on February 23.

Postdoctoral Associate **Thomas Serre** and wife **Alison Tovar** welcomed their first child, a daughter they named **Lia Gabrielle Serre-Tovar**, on September 19th.

Grad Student **Christopher Hirsch** married **Jennifer Tsang** on January 1, 2008.

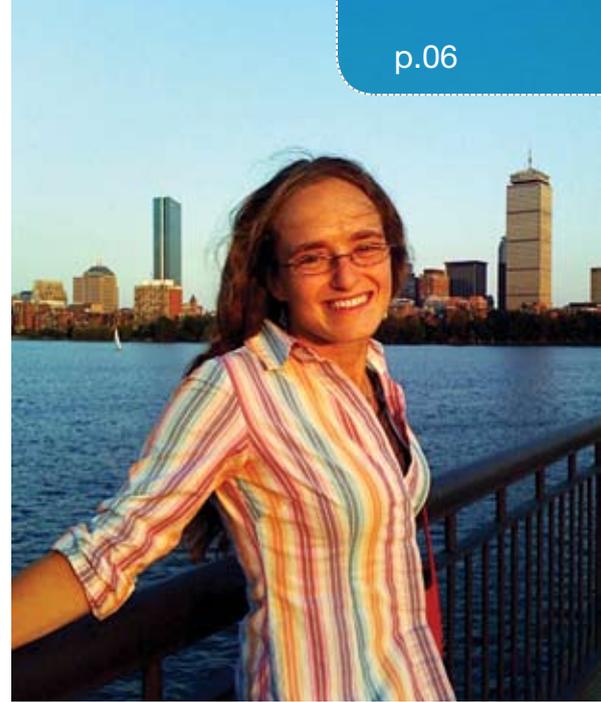
Postdoctoral Associate **Noa Ofen** and husband **Julian Wong** welcomed their first child, a boy on April 30. The baby’s name is **Goni Guan Yi Wong**.

On May 5 new parents Research Scientist **Sheeba Arnold Anteraper** and **Shibu Anteraper** welcomed son **Samuel**.

## Faculty Profile: Rebecca Saxe



Rebecca, at right, scuba diving with husband Allan Adams



**At any given moment, most people harbor within them a number of potentially disjointed—and sometimes conflicting—ambitions.** But if you have ever wondered how the desire to conduct field-leading research in cognitive neuroscience can peacefully coexist with dreams of running a bed and breakfast, then you just have to meet BCS Assistant Professor Rebecca Saxe.

For as long as she can remember—and Rebecca confesses to having an imperfect autobiographical memory—her goal has been to be a scientist. With parents who are both lawyers, another direction might have seemed more natural, but there was a lot of family support and experience in the sciences. Her mother, in fact, had intended to become a chemist, but a tendency to break things in the lab caused her professors to encourage another career path.

Before she could become a scientist, however, Rebecca had to navigate an educational system that did not fully engage her. “I spent my whole childhood looking forward to going to college because I’ve always thought of it as this place where you got to study things that were at the edge of possibility.” She began her formal preparations at age 12 when her mother gave her the course catalog for Dalhousie University as a gift. Within a matter of days, Rebecca had traced back the prerequisites for all of the advanced genetics classes (her interest at the time) and had developed a comprehensive five-year plan for her education. “I was really anxious to go to college,” she notes.

Rebecca ended up abandoning her meticulous course schedule when she was admitted to Oriel College, one of Oxford University’s oldest member institutions and one of the last to admit women. For someone who had so thoroughly planned every aspect of her education, Rebecca found the unstructured form of Oxford’s tutorial system empowering. “I am really grateful that I got to go to Oxford because it suited me perfectly and in a very deep way that I couldn’t have had anywhere else in the world,” she says. “I was given an extraordinary amount of responsibility for my own education and I felt like there was no limit on what I could learn.”

One attraction of Oxford was the freedom to specialize in both arts and sciences. Rebecca chose to study “the three Ps”—Psychology, Physiology, and Philosophy. While there, she also gained her first research experience as an undergraduate in Kia Nobre’s lab studying attention and memory. Nobre had previously avoided taking undergraduates, but she took a chance with Rebecca. “I guess I looked keen,” she notes, “which I was.” The experience was a valuable one and Rebecca cites Nobre as a major influence in her life and career.

Oxford also was rich in non-academic activities. Rebecca’s first year found her directing a radio play and rowing competitively. Later, she engaged in competitive ballroom dancing, competing in eight dances (quickstep was her specialty) on the university circuit in England and in Florida. But these activities never overshadowed her scientific aspirations—when the dance competition in Florida was scheduled the same week her graduate applications were due, Rebecca danced by day and completed applications late into the night.

Rebecca came to BCS as a graduate student for two primary reasons. “Of the places I applied, I was most proud of getting into MIT,” she says. “That was reason number one.” The other reason was the interest shown by BCS faculty member, and now peer, Nancy Kanwisher. In describing the support and guidance that Nancy has provided over the last ten years, Rebecca is effusive. “I have a volatile emotional response to science; I get very up when it’s going well and very down when it’s not. Nancy has always been able to remind me of why I am a scientist. I couldn’t have done it without her.”

Rebecca’s graduate work (with Nancy Kanwisher, of course) on the neural basis of social cognition earned her an early reputation as someone to watch. After completing her doctorate, she spent three years as a Junior Fellow at Harvard, working with Susan Carey on the development of social cognition and causal reasoning in infancy.

BCS reclaimed Rebecca as a faculty member in 2006, and she continues in the same area of research. Building on work she started here as a graduate student, she studies what is called Theory of Mind—the mechanism by which people infer and reason about others’ states of mind.

**“I think it’s the deepest puzzle in science that we have these neurons in a computing machine and that they can represent and compute abstract thoughts”**

Her research makes use of fMRI to look at the group of brain regions in human cortex that underlie this mechanism. Rebecca, however, regards Theory of Mind as just a case study, albeit an important one, in a much broader question. "I want to know how the human brain implements abstract thinking," she says. "I think it's the deepest puzzle in science that we have these neurons in a computing machine and that they can represent and compute abstract thoughts."

As busy as the life of an Assistant Professor is, Rebecca still enjoys a rich variety of experiences outside of the lab. Just over a year ago, she married Allan Adams, whom she met when they were both Junior Fellows at Harvard. Allan is an Assistant Professor in MIT's Physics department studying String Theory. Together, they share a number of activities including hiking, bicycling, flying gliders (real as well as radio-controlled), and cooking—especially breakfast. "I love breakfast," says Rebecca. "Every possible version of breakfast is, I think, fantastic."

And the bed and breakfast? "It's an escape fantasy," she laughs. "I don't mind doing laundry and I really love to cook breakfast and those are the two most important skills at a B and B." The escape, however, may not come so easily. "The problem is that if you play the fantasy out to month two, Allan and I are sitting in the back room reading papers. I guess that means I still really want to be a scientist." ■

## The BCS Summer Social



Fun in the sun for families, dogs, and Straw Dogs.

## Noteworthy

### Faculty

**Emery Brown** was one of six MIT faculty members to be named a Fellow of the Institute of Electrical and Electronics Engineers (IEEE). In October, Brown was also named a Fellow of the American Association for the Advancement of Science.

**Bob Desimone** was named to the newly endowed Doris and Don Berkey Professorship.

**John Gabrieli** and **Nancy Kanwisher** were awarded an \$8.5 million Ellison Medical Foundation grant to study the brain basis of autism and dyslexia.

**Yasunori Hayashi** received both the Japanese Society for the Promotion of Science (JSPS) Prize and the Japan Academy Medal for his work on molecular mechanisms of hippocampal synaptic plasticity.

**Earl Miller's** paper, "An Integrative Theory of Prefrontal Cortex Function" (Miller and Cohen, 2001) was designated a Current Classic by Thomson Scientific for being among the most cited papers in Neuroscience and Behavior.

**Elly Nedivi** received the Julie Martin Mid-career Award in Aging Research from the Ellison Medical Foundation and AFAR.

The BCS Fall 2007 Award for Excellence in Undergraduate Teaching (Faculty) was given to **Aude Oliva**.

**Tomaso Poggio** was the tutorial speaker at NIPS (Neural Information Processing Systems), December 2007.

**Rebecca Saxe** received the Cognitive Neuroscience Society Young Investigator Award acknowledging contributions that she has made to the field of social cognitive neuroscience. She was also awarded the 2008 Packard Foundation Fellowship.

**Sebastian Seung** was awarded the 2008 Ho-Am Prize in Engineering, a special award of the Samsung Welfare Foundation presented to ethnic Koreans who have achieved world-class standards in creative research.

**Li-Huei Tsai** was elected into the Academia Sinica of the Republic of China.

The BCS Fall 2007 Award for Excellence in Undergraduate Advising was presented to **Pawan Sinha**.

**Josh Tenenbaum** was selected as a recipient of the 2008 American Psychological Association (APA) Distinguished Scientific Award for Early Career Contribution to Psychology in the area of cognition and human learning. Josh and his lab were recognized with two additional awards in computational modeling in 2007 for Best Paper on Perception and Action as well as Best Paper on Higher-Level Cognition.

### Staff

**Rutledge Ellis-Behnke** was featured as one of eight nano-experts in an article titled "Ophthalmology on the Nanofrontier" in the November issue of the American Academy of Ophthalmology's publication, EyeNet magazine.

Postdoctoral Fellow **Daniel Bendor** received a Helen Hay Whitney Fellowship.

Postdoctoral Fellow **Evelina Fedorenko** will be getting a K99 award from the NIH.

Postdoctoral Fellow **Srideva Sarma** won a Burrough-Wellcome Fund CASI award.

### Students

Four BCS undergrads were selected as 2008 Burchard Scholars: juniors **Stephanie Chan** and **Matthew Serna**, and sophomores **Matthew Cohen** and **Niyatec Samudra**.

Angus MacDonald Awards for Excellence in Undergraduate Teaching went to Graduate Students **Paymon Hosseini, Jim Mutch, Li-Wei (Livia) King, Talia Konkle, Michael Frank** and **Chris Baker** for their Fall '07 efforts, and to **Ulf Knoblich, Michelle Machon**, and **Srinivas Turaga** for the Spring 2007 term. For the Spring '08 terms, these awards went to: **Ulf Knoblich, Michelle Machon, Srinivas Turaga, Paymon Hosseini, James Mutch, Li-Wei (Livia) King, Christopher L. Baker, Talia Konkle**, and **Michael Frank**.

The Walle Nauta Award for Continuing Dedication to Teaching was given to **Amy Perfors** for Spring 2007 and Spring 2008.

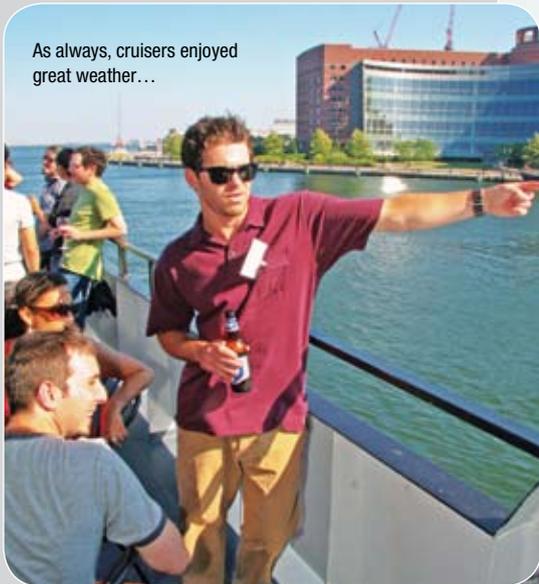
The Walle Nauta Award for Outstanding Research in Brain & Cognitive Sciences was presented to **Adina Fischer '08, Lizabeth Jordan '08, Suejean Lim '08**, and **Michael Obilade '08**.

Honorable Mention for Outstanding Academic Record went to the following class of 2009 students: **Sha-har Adomni, Alice Ainsworth, Stephanie Brenman, Tharian Cherian, Abigail Clark, Jaquelyn Gold, Lauren Habenicht, Denise Ichino, Gloria Lee, Christopher Moses, Navine Nasser-Ghodsi, Kimberly Reinhold, Matthew Serna, Irina Shklyar, Jordan Sorensen, Adita Joshi**, and **ManJae Kwon**.

## In Memoriam

It is with deep sadness that we note the untimely passing of senior Robert M. Wells on March 1, 2008. Robert was a vibrant and engaged member of the BCS community and he will be missed by all and, most especially, by his classmates.

As always, cruisers enjoyed great weather...



beautiful views of downtown Boston...



### The BCS Cruise



good times...

and a fascinating talk by Emery Brown.



Five years of BCS graduate students: Chris Baker ('04 entering class), Scott Gorlin ('05), Caroline Runyan ('06), Yarden Katz ('07), John McCoy ('08)



Honorable Mention for Outstanding Research is given to sophomores and juniors for exceptional research activities within the department. This year's awards went to juniors **Tharian Cherian**, **Danbee Kim**, and **Denise Ichino**, and to sophomores **Ainsley Braun** and **Isabel Chang**.

The Han-Lukas Teuber Award for Outstanding Academic Achievement at MIT went to seniors **Zainab Azeez**, **Adina Fischer**, **Irene Headen**, **Kaitlin Kamrowski**, **Peter Lai**, **Nune Lemaire**, **Tao Liu**, **Jamie Mehringer**, **Narine Mousissian**, **Caroline Rubin**, **Mariam Shaikh**, **Tess Veuthy**, **Angeline Wang**, and **Rany Woo**.

**Irene Headen** received the Albert G. Hill Prize.

**Tau Liu**, **Nune Martirosyan**, **Jamie Mehringer**, **Caroline Rubin**, and **Mariam Shaikh** were all named to Phi Beta Kappa. **Caroline** also won the Louis Kampf Writing Prize in Women's and Gender Studies.

BCS graduating seniors **Tao Liu** and **Tess Veuthy** were named Fulbright Scholars.

# First Year Graduate Students Aspire to Hollywood Greatness

## If you ever wished Hollywood would take more of an interest in brain science

when concocting plots for their summer blockbusters, you might want to team up with one of these first-year grad students and submit an idea. In an effort to get to know the incoming group, students were asked to come up with a working title, summary, casting possibilities and opportunities for explosions or other dramatic effects for a high-budget summer blockbuster.

### Matthew Dobbin

**Working title:** Mutant Brains from Planet X

**Summary:** In the near future, contact with an alien race of levitating brain creatures is established. Although they appear to be friendly, a brilliant neuroscientist uncovers their plan to control the U.S.A. through a pop-music group. This brain scientist must use his knowledge of the brain along with his karate skills to save the country.

**Cast:** Brad Pitt will play the role of the neuroscientist and Angelina Jolie will play his love interest.

**Explosions?** Explosions will be used whenever possible.

### Charles Frogner

**Working title:** There Will Be Dorsolateral Lesions

**Summary:** A young graduate student breezes past the competition in graduate school, achieving several stunning discoveries and attaining his Ph.D. within three years. Along the way he romances a beautiful starlet whose life he saves during a shootout with the mob.

**Cast:** I always thought Hugh Grant and Julia Roberts should do a movie together.

**Explosions?** One of the hero's scientific discoveries will be made when he must defuse a bomb that is wired to depend on the function of certain circuits in visual cortex. There will also be big explosions.

### Rodrigo Garcia

**Working title:** The Memetic Wars – Episode XXI

**Summary:** Humankind finds itself at the mercy of Memeto after he steals government plans for the first ever direct neural interface device, iBrain. Now a team of top secret Marine Philosophers and Navy Comp Scientists must find a way to stop Memeto before he enslaves all of humanity, forcing everyone to watch nonstop reality shows.

**Cast:** Ricky Gervais plays the role of the Navy Commander and Audrey Tautou plays Memeto's mischievous sidekick.

**Explosions?** All major action scenes take place in a cyber battlefield, where, from their Elite Armchair units, the Marine scientists face off with Memeto's Henchmen.

### Aziel Ghadooshahy

**Working title:** Augmentation

**Summary:** A prominent young scientist at MIT develops neurotechnology that greatly enhances human cognitive abilities allowing for telekinesis. He tests the new technology on himself, and soon things start blowing up and the military gets involved.

**Cast:** The brain scientist is played by Jake Gyllenhaal, and the love interest by Gwyneth Paltrow.

**Explosions?** It's easy in this story. Jake Gyllenhaal becomes warped by his own technology and his lover, Gwyneth Paltrow, holds the key to stopping him on his path to destruction. He blows a lot of stuff up before he is ultimately stopped. Other special effects include levitation, time warps and a psychedelic sequence when the scientist first uses the neurotechnology on himself.

### Emily Ko

**Working title:** Scary Movie n

**Summary:** Typical mad scientist wreaks psychological havoc when the President of the United States appoints him Surgeon General—where he is in a position to effect population-wide, targeted norepinephrine infusions, enabling him to spark national panics over whatever. Hold on to your basolateral amygdalae!

**Cast:** The Rock

**Explosions?** Not so many as this is a Scary Movie. However, do look for a cameo by the flashbacking ghost of Phineas Gage.

### Joel Leibo

**Working title:** The Man Who Knew Too Much

**Summary:** A new movie take on the Faust legend. A man makes a bargain with an insidious neuroscientist to implant the sum of all human knowledge into his brain. All goes well until his head swells to enormous size and he is shunned by the rest of human society.

**Cast:** The brain scientist would be played by Jeremy Irons. The main (Faust) character would be played by Matt Damon (he already has kind of a big head) and his (unrequited) love interest would be the girl from Nickelodeon's show Alex Mack (the one who turns into a puddle of goo).

**Explosions?** There are no explosions as this is a sad movie. There will however be a really trippy dream sequence in the scene where the knowledge is implanted into his brain.

### Nuné Lemaire

**Working title:** The Conditioned

**Summary:** It is 2015. The British government establishes a secret neuroscience institute to find a psychological approach to improving the economy following the 2008 crash. They come up with a euphoria-inducing gas, and find that it has a special property of creating one-trial positive pavlovian conditioning. A disgruntled and greedy scientist sells the still-secret recipe to struggling toy giant Ty, makers of Beanie Babies. Ty starts an advertising campaign in movie theatres where the gas is released during commercials, producing an out of control Beanie Baby craze. In the ensuing chaos, one brave neuroscience graduate student tries to save his girlfriend and the rest of the world by inventing an antidote.

### Laura Lewis

**Working title:** Corr Techs

**Summary:** Crime-fighting neuroscientist Corr Techs saves the world. Also, his lengthy expositions on the brain enlighten the audience.

**Cast:** The brain scientist is Robert Downey Jr., who has scientist/superhero experience from Iron Man. The love interest is Christina Ricci due to her unusually large head.

**Explosions?** Big explosions are involved when our hero gets really angry. He explodes buildings with the sheer power of his brain knowledge.

### Joshua Manning

**Working title:** Silence of the Glands: Hannibal's Massacre Without Fear

**Summary:** This sequel to Silence of the Lambs picks up just after Hannibal Lecter discovers his enjoyment of feasting on Ray Liotta's cortex as way to murder him. He soon discovers the effectiveness of using his gourmet skills with the hypothalamus which removes a key part of the HPA axis, allowing him to eliminate the physical response to fear, which in turn silences the glands, making his murder spree less difficult in his old age while satisfying his unending need for the study of neural anatomy and behavior.

**Cast:** Anthony Hopkins, of course.

**Explosions?** The explosions will take place when agent Starling tries to catch Dr. Lecter for the fourth time. Of course, Dr. Lecter's body is never found.

### John McCoy

**Working title:** It's All in Your Head

**Summary:** A neuroscientist regains consciousness after being a subject in a colleague's routine experiment. She's hearing voices in her head, her colleague has disappeared, and the



from l to r: Azriel Ghadooshahy (back), Christopher Saenz, Matthew Dobbin, Josh Manning (front), Joel Leibo (back), Melissa Troyer, Charles Frogner, John McCoy (back), Josh Siegle, Tomer Ullman (back), Emily Ko, Rodrigo Garcia (middle), Laura Lewis (back), Sangyu Xu, Jakob Voigts, Tatsuo Okubo. Not pictured: Nuné Lemaire.

monkeys in the lab are acting strangely. Nobody's taking her seriously, but someone dangerous is after her hippocampus...

**Cast:** At the casting director's discretion.

**Explosions?** Gratuitous explosions are always good, especially with bits of flying cortex. You could also produce some serious visual mayhem with a bunch of MRI machines and lots of jagged metal.

### Tatsuo Okubo

**Working title:** A Memory Potion

**Summary:** Trying to help his amnesic girlfriend, a neuroscientist makes a single dose of drug to boost memory. That information leaks somehow and he has to go through numerous battles to defend the drug from many others craving it. He manages to defend it in the end, but suddenly throws it away declaring that he loves his girlfriend as she is.

**Cast:** The brain scientist will be played by Robert De Niro, the love interest by Nicole Kidman.

**Explosions?** No explosions. It's a romance.

### Christopher Saenz

**Working title:** Devilution

**Summary:** An epically bad B-Movie about an over-the-top mad scientist hell-bent on mass mind control. The physicist hero who tries to stop him realizes too late that the mad scientist is his father and, instead, joins him in his quest for global domination.

**Cast:** The role of brain scientist is played by Gary Oldman and the love interest by Helena Bonham Carter.

**Explosions?** The big explosions will be low budget CGI and off the shelf sparklers. Think Big Trouble in Little China meets your average Sunday afternoon SciFi Channel movie.

### Josh Siegle

**Working title:** Neural Justice League!

**Summary:** Watch as distinguished neuroscientists

use their unique superpowers to defend explanations of brain function from the evil Homunculi.

**Cast:** Starring a mustachioed Kal Penn as Vilayanur "Phantom Limb" Ramachandran, a bearded Bill Murray as Roger "Brain Splitter" Sperry, and a clean-shaven William H. Macy as Bert "Patch Clamper" Sakmann, not to mention an unforgettable performance by Larry David as Eric "Watch Out For My Bow Tie" Kandel.

**Explosions?** Prepare to be awed as the League fights an explosive battle for ocular domination on the Receptive Minefield.

### Melissa Troyer

**Working title:** The Little Neuron Who Could

**Summary:** In Disney-Pixar's controversial new film, little Dopie the dopaminergic neuron learns a hard lesson when his human goes out for a night on the town. Will Dopie's human ever learn to control her drinking habits, or is Dopie in for a life of mistrust and abuse?

**Cast:** The voice of Dopie is played by Bruce Willis, and his love interest, the ever-inhibitory Gabbie, who unknowingly thwarts some of Dopie's greatest dreams, is played by Megan Mullally.

**Explosions?** In the most talked-about scene of the year, Dopie and Gabbie conduct action potentials in exuberantly explosive spikes. The results are too exciting to mention here . . .

### Tomer Ullman

**Working title:** Gray Matter

**Summary:** Brilliant Prof. Julian Gray invents prosthetic brain-enhancements that give him incredible abilities. He is then chased by the government because they are Evil, but Prof. Gray is Good, and he will WIN.

**Cast:** Gray is played by Bruce Willis wearing glasses, because glasses are Hollywood's Tenure Track. The love interest will be an intelligent robot that Gray invented. It will be animated by CGI and will look exactly like Uma Thurman.

**Explosions?** The whole movie starts with a dream sequence of Gray's lab exploding. Later, Gray's lab EXPLODES FOR REAL. The rest of the movie is basically a series of explosions that Gray narrowly escapes using his enhanced intelligence, until at last he blows up the Government using his prosthetics, thereby losing them.

### Jakob Voigts

**Working title:** Paper

**Summary:** Via some arbitrary plot device a disgruntled, jobless architect has to come up with a ridiculous sum of money and turns to fraudulent research funding after finding an abandoned copy of Nature in a bus.

**Cast:** Helena Bonham Carter would play the brain scientist, and John Cusack the love interest.

**Explosions?** There will be a grand 'wag the dog'-like scene of masterful photoshoppers and data fabrication as well as oodles of colorful pseudoscience. Also, there will be a gratuitous 'the usual suspects' moment!

### Sangyu Xu

**Working title:** Mental State

**Summary:** A conservative Senator and presidential candidate takes part in a celebrity reality show "Are You Blue or Red?" hosted by a cognitive scientist. While the Senator is in the fMRI a malfunction alters his brain states releasing quite a bit of inhibition. As a result he becomes funny and liberal and he wins the election in a landslide. Eventually he quits his job because he cannot focus on serious matters and becomes a liberal talk show host.

**Cast:** Jim Carrey is the Senator, and Kate Winslet the cognitive scientist.

**Explosions?** It is unavoidable that various evil powers from gangs to corporations go after our heroes resulting in big explosions, high speed car chases and romance.

## The Straw Dogs players—students, faculty, staff and postdocs—represent the breadth of BCS and its interests

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postdocs representing the breadth of the Department and its interests. In this system, enthusiasm and team spirit trump other considerations and all players, regardless of experience or ability, play every game. “The Straw Dogs embody the whole team concept,” says Jason Cromer. “Even with a team roster of 18, everyone is happy to share playing time.” Rotating the players equally sometimes poses a challenge, especially when playing against teams who may not do the same. “Anyone can stuff a team with jocks and win a championship,” says Chris Moore. “We won without compromising on our core principals which value fun, community, and equality above all else.”

Men and women, faculty, staff, grad students, lab managers, postdocs from McGovern, Picower as well as BCS play on the team. There is a range of abilities as well—some players have played since high school, and others are learning for the first time.

Next year, the Straw Dogs may be moving into a higher-level league. Jason Cromer hopes to preserve the team’s philosophy while remaining competitive when faced with the greater challenge. “The level of competition will be more stressful,” he says, “but it will be interesting.” He is looking forward to seeing everyone on the team again next season. ■



top: power-hitting machine  
Reuben Goodman  
right: the Cromer  
family—a two-headed  
softball monster



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