



MESSAGE FROM THE DEPARTMENT HEAD

Mriganka Sur

The Fall semester started with a special faculty appointment in our department. In late August, the search committee for a new MIT President announced the selection of neuroscientist Susan Hockfield as the next President of MIT. Susan, who will assume her duties on December 1, will also hold an appointment as tenured professor in Brain and Cognitive Sciences. Susan is the first life scientist and the first woman to be appointed President of MIT. She comes to us from Yale, where she is currently Provost and the William Gilbert Professor of Neurobiology. It is a particular pleasure to welcome Susan to MIT and BCS: she and I started our faculty careers as Assistant Professors at Yale School of Medicine, where we had adjacent labs and published a few papers together.

We are also delighted to welcome Robert Desimone as the new Director of the McGovern Institute for Brain Research. Bob's appointment as a tenured professor in BCS started in October, though his laboratory will move straight into the new building next year. He comes to us from NIMH, where he was most recently Scientific Director of the Intramural Research Program.

Our priority in faculty hiring in the past year was to rebuild the cognitive group, and the 2004 faculty appointments in BCS have all been in that group. Aude Oliva started her appointment as Assistant Professor of Visual Neuroscience in July 2004. Aude studies visual perception and classification of real-world scenes by human observers using techniques from visual psychophysics, computational modeling, and fMRI. Laura Schulz, who will start her appointment as Assistant Professor of Cognitive Science in January 2005, studies causal reasoning in children using experimental approaches and computational models of causal inference. John Gabrieli will join the department as the Grover Hermann Professor of Cognitive Neuroscience in Fall 2005. John, who studies human memory

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BCS IN THE NEWS

Picower Professor of Neuroscience Mark Bear, together with scientists Kimberly Huber and Stephen Warren, have developed a theory about the mechanism controlling Fragile X Syndrome that may lead to its treatment in the near future. Their research, published in the July edition of *Trends in Neuroscience*, shows that the critical brain protein which normally dampens signals from a brain-chemical receptor called mGluR is blocked by the Fragile X mutation, thus allowing some overactivity by the mGluR and eventual weakening of connections between cells, impairing brain development. Mark is using a biotech firm he cofounded, Sention, to do the preliminary safety testing of mGluR blocking drugs in cells and animals before any clinical trials can be conducted on humans.

Assistant Professor Yasunori Hayashi, has been studying how brain cells accomplish their plasticity by studying the shape-shifting cell protein actin. Together with Postdoc Associate Ken-Inchi Okamoto and Takeharu Nagain and Atsushi Miyawaki of the RIKEN Brain Sciences Institute in Japan, they found that key processes, LTP (long term potentiation) and LTD (long term depression), both affect forms of actin. They believe that if they can use this discovery to manipulate actin equilibrium, they may be able to manipulate synaptic plasticity and thus control the learning power of the brain. Their work was highlighted in the Sept. 5 issue of *Nature Neuroscience*.

Postdoc Jessica Newton and graduate student Charlene Ellsworth, both *continued on page 6*



Professors Susan Hockfield (l.) and Martha Constantine-Paton (r.) on the BCS fall cruise



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FALL 2004 CALENDAR OF EVENTS

- Mondays** Brain Lunch
- Tuesdays** Cog Lunch
- Wednesdays** Brains & Machines Lecture Series
- Alternate Thursdays** Plastic Lunch
- Fridays** BCS Colloquium followed by Reception
- Alternate Fridays** BCS Vision Seminar Series

SPECIAL EVENTS

- Friday, October 8,** The Hans Lukas Teuber Memorial Lecture, 4:00 PM, Wong Auditorium Speaker: Daniel Kahneman, Ph.D., Professor of Psychology & Public Affairs, Princeton University. "Toward a Science of Well-Being"
- Tuesday, October 26,** The annual BCS Mixer at the 2004 Society for Neuroscience meeting, 5:30 to 8:00 PM at The Bitter End, 770 Fifth Ave., San Diego, CA.
- Friday, December 10,** The BCS Holiday Party, 4:00 to 7:00 PM in the Media Lab atrium



BCS WELCOMES NEW GRADUATE STUDENTS

Bottom Row (l to r): Liz Baraff, Kathleen Cho, Michelle Greene. Row 2: John Kraemer, Barbara Hidalgo-Sotelo, Kate Hooppell. Row 3: David Ziegler, Sam Horng, Ethan Meyers. Row 4: Ethan Skowronski-Lutz, Dominique Pritchett, Jake Bouvrie. Top row: Viren Jain, Chris Baker. (Not pictured: Paymon Hosseini-Varnamkhasti.)



Chris Baker is from Washington, and at the University of Washington he majored in computer science and statistics and minored in linguistics and math. His area of interest is computational cognitive science. He enjoys music, running, baseball, and surfing.

Liz Baraff is from Berwyn, PA and went to school at Northeastern University. She is interested in Computational Cognitive Development, i.e., applying computational approaches to understanding children's cognitive development. She hopes to stay in academia after graduation. Liz is also a singer, plays piano and writes music. She has been singing with a semi-pro a cappella group called 'Integration by Parts' (www.integratibyparts.org), which often does gigs around the Boston/Cambridge area. She recently founded a charity called 'Vocal Band Aid' that raises money for music education in local area schools.

Jake Bouvrie, from Arlington, MA, graduated from MIT with SB degrees in Electrical Engineering and Mathematics, and just finished an M.Eng. in EECS, also at MIT. He is primarily interested in learning in machines and humans, and in biological and computational vision. In the long run, he thinks he'd rather spend most of his time doing research than teaching classes. As for hobbies, he enjoys travelling and, over the past three years, spent about a year living and traveling in Southeast Asia, and studying Thai.

Kathleen Cho grew up in Northern NJ and attended Brown University where she double majored in neuroscience and history. She is interested

in studying more about learning and memory systems. She loves listening to music and attending concerts (loved Coachella in California and Dedbeat in England), watching interesting films, and taking photographs.

Michelle Greene is from Colorado, and did her undergraduate work at USC, but is very happy to be out of LA. She is currently working with Aude Oliva on topics of scene perception. When not working, she enjoys expending her extra "hot air" playing bagpipes and long-distance running. She hopes to qualify for the Boston marathon while in this area.

Barbara Hidalgo-Sotelo is a native of Austin, and her "area" of interest includes the nature (evolution and function) of perceptual systems and reasoning. At this time, her vision of her future persona is being the principal investigator of a productive lab at an excellent teaching institution, and having 2 dogs. Watching/playing sports, reading, coffee, and the moon make her happy.

Sam Horng was raised in rural Virginia, then went to Columbia in NYC where he studied biology. After college, he completed a fellowship in bioethics at the NIH and then two years of medical school in the Harvard-MIT HST program. He is interested in working on mechanisms of synaptic plasticity

and cortical and/or thalamic realization. His hobbies include drawing, reading, watching movies, and making pottery and paper mache masks.

Catherine Amanda Jane Hooppell (Kate) attended Rutgers University as an undergraduate where her focus was neuroscience and psychology. At MIT she is interested in doing research in either systems neuroscience or cognitive science. Her other major interest is writing, and she particularly admires Tolkien (for his idealism and escapism), Kundera (for his lonely style and for his insight into emotions and motivations), and Douglas Adams (for his sarcasm and wit).

Paymon Hosseini-Varnamkhasti was born in Tehran, Iran and came to the US at age 16. His undergraduate studies in math and physics were at the University of Chicago. He did a fair amount of PLD (programmable logic device) programming for his undergraduate research in the physics department, which led to an interest in neuroscience, which he began to study in his third year. After graduation, he worked in the laboratory of Prof. Bradley in Chicago for two years on motion segmentation before applying to the BCS graduate program. His hobbies are foosball and anime.

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NEW BEGINNINGS

Mara Breen, a BCS grad student, and husband **Henri Bouthet** have a daughter, **Adelaide Colette**, born on April 26.

Operations and Financial Officer **Sheila McCabe** and husband **James** welcomed their new son **Patrick Martin** on July 25.

Postdoc **Mehmet Cansev** and wife **Asuman** welcomed their new daughter **Zeynep** on August 7.

Postdoc **Bill Decoteau** and wife **Tara** have a new baby girl, **Catherine Rose**, born Aug. 9.

Administrative Assistant **Emily Walazek** and husband **Mikail Kysiak** have a son, **Adam Patrick**, born on August 13.

Administrative Officer **John Armstrong** and wife, **Lauren**, welcomed daughter **Hayden Ellery** on Oct. 14.

Professor **Ted Adelson** and wife, Principal Research Scientist **Ruth Rosenholtz** welcomed their new daughter, **Sarah Louise**, on October 19.

Prof. **Gerald Schneider** and wife **Amy** were married in July, as were Assistant Prof. **Carlos Lois** and **Elizabeth Hong**.

Grad student **Jodi Davenport** and **Joe Bunik** were married in September. Administrative Assistant **Casey Johnson** and **Mike Houlihan** were married October 2.

Grad student **Melissa Warden** and **Ian Ellwood**, who was a graduate student in physics at MIT, became engaged this September and plan to marry next summer.

Grad student **Amy Pooler** and **Ronan Flynn** are engaged to be married next June in Boston.



MICHALE FEE



Michale with his faithful companion Shadow

Michale is the son of two educators: his father, a biochemist currently at Scripps Research Institute, and his mother, a science and math teacher at the elementary school level. By age 6, Michale had managed to build a radio for his mother. He also experimented with chemistry sets received as gifts — occasionally blowing things up — and took apart old TVs and radios to figure out what each part did. Electronics were his favorite and he had a Heathkit with many different circuits you could wire together. He even wired up the house so he and his sister could talk past their bedtime. His early interest in how things work eventually led to an interest in how the brain works.

The family always lived in the country and his family owned several farm animals, so Michale shoveled lots of manure. He alternated between chores and searching the local junkyard for fun items. He particularly loved gas engines, but was never able to make one run his homemade go-cart. He also took piano lessons starting at age 8 and throughout high school.

Michale was a self-professed nerd in school, prompting his 5th grade teacher to call him the absent-minded professor. It was the first indication he was headed for a career in academia. When the family moved to Ann Arbor because his father became a professor at the University of Michigan, he decided school was fun. He played the French horn in the high school orchestra, but because the family lived out of town, participation in organized sports was difficult to arrange. However, at age 14, he and his father flew gliders and he got his pilot's license at 16. Unfortunately, because circling in thermals made him airsick, he found this hobby unsettling. Michale focused instead on science fair projects and in his senior year he went to the national science fair with a little 3 wheel robot he made. It consisted of a single board computer he programmed in machine language. You could show it what to do — it would remember and repeat it. He says that a similar phenomenon happens with the songbird, which he

currently studies: the baby listens to its parents and tries to repeat the same thing. He was also into ham radio, building his own shortwave set from a Heathkit to be able to talk to people around the country in Morse code. Unfortunately, his limited speed with Morse code kept him from passing the test which would have allowed him to use voice communication. His reading materials included Zen and the Art of Motorcycle Maintenance, the Ring trilogy, and science fiction. He also went on to get his power pilot's license. Since he didn't have to constantly circle in these planes, he was not subject to the nausea that plagued him in gliders.

Eventually, Michale enrolled at the University of Michigan where he majored in engineering physics. Just before graduation, he met his future wife, Isabella, who had transferred there as a sophomore. When he went to Stanford to study applied physics, they maintained a long distance relationship for 3 years, and eventually married. Michale was still trying to figure out his career path, when Steven Chu moved to Stanford from Bell Labs. In Steve's lab, Michale did laser spectroscopy of positronium, an antimatter atom even simpler than hydrogen, in order to test the theory of quantum electrodynamics (QED). He measured the energy spacing of two states to a part per billion, which is like measuring the distance from here to the sun to an accuracy of 500 feet. He was disappointed that the QED theory was correct, although he should have known better than to argue with Feynman. It was fun playing with the toys used in physics — like lasers and antimatter — but found it can take a long time to get an answer, so he started to consider what else he might do.

His positronium experiments were actually carried out at Bell Labs in New Jersey. During this time he met David Tank, David Kleinfeld, and other members of the Biological Computation Research Department. He did a small project with David Kleinfeld using voltage sensitive dyes to measure oscillations in the olfactory system of the garden slug, which gave him a taste for

neuroscience, if not for slugs. Michale loved being able to do an experiment within a few weeks and come up with an answer. Also, compared to physics, he found it easier to think of interesting things to do that hadn't been done before. The fast turnaround between idea and answer appealed to him, as did the ability to do small-scale experiments that would test important ideas.

David Kleinfeld then offered him a postdoc position at Bell, so he moved back to Stanford to complete his thesis and take his one-and-only university neuroscience course. He then returned to Bell in the Fall 1992 and worked on whisking rats in David's lab. Michale did chronic recordings of neurons in behaving rat, and particularly enjoyed the challenges of developing new recording and behavioral techniques. When David left Bell, Michale was offered the opening. He became interested in the songbird as a model system for vocal production and learning. It was a beautiful black-box problem — you know exactly what it does, where the pieces are: you just have to figure out how it works — just like an interesting item found in a junkyard. So Michale started to work with zebra finches. It took him 10 years to decide what he really wanted to do, but he is now very focused and determined to understand at a fundamental level how the brain learns complex behaviors.

He loves being here because of his MIT students and postdocs, and the opportunity to share ideas with them and with his colleagues. He has already started collaborations with Sebastian Seung, Carlos Lois, and Jim DiCarlo in this department, and with Rahul Sarpeshkar in EECS.

His wife Isabella is a Hopwood poet and homemaker. Daughter Gabriella is 12 and is really into horses, while son Jonathan, who just turned 7, prefers Legos and mechanical things. Though Michale enjoys organic gardening, he has no time for it now, but he still plays the piano, particularly ragtime and some classical. Most of his spare time is spent with his family and at his daughter's softball games. On weekends he cooks his favorite Indian foods and sushi.



Everyone is waiting patiently to board the ship for the 2004 cruise



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Message from the Dept. Head

systems using fMRI, will have a joint appointment in the Division of Health Sciences and Technology (HST) and direct the human imaging facility in our new building. We have ongoing searches this year for two more additions to our cognitive faculty to round out the group.

We continue our tradition of offering joint appointments to faculty in other departments who have significant interest in brain and cognitive sciences. This fall, Assistant Professor of Nuclear Engineering Alan Jasanoff has accepted a joint appointment in BCS. Alan is interested in increasing the resolution of fMRI techniques for studies of subtle activity-dependent changes in the brain, and in designing paramagnetic molecules that can actually be coded by DNA and expressed genetically.

Our new building, which will house the laboratories and headquarters of BCS, the McGovern Institute for Brain Research and the Picower Center for Learning and Memory, is nearly 70% complete, and we are on track (no pun intended) to move into it in Fall 2005. With the imminent move, we have started the next major phase of expanding the BCS faculty. Several new appointments into PCLM, made between 1998 and 2003, fueled the growth of molecular neuroscience in BCS, and PCLM is now looking to make new appointments in systems neuroscience and mechanisms of disorders or disease. New appointments in MIBR, made between 2000 and 2003, expanded the systems group in BCS, and MIBR is now seeking to make several additional appointments as well.

In our vision for expanding the scope and reach of neuroscience and cognitive science at MIT, we worked with the MIT administration -- in particular President Charles Vest, Provost Robert Brown and Dean of Science Robert Silbey -- to develop a model with three key components: the creation of two research centers (MIBR and PCLM) which would work closely with the department in adding faculty and labs in critical research areas, and expansion of funding for graduate students in BCS, so that graduate training could keep pace with the faculty expansion. I am very pleased to announce that this third component of our vision has now been funded -- a major graduate fellowship fund was established this fall in memory of Henry E. Singleton (1940). When fully funded, in 4 years, income from the gift will provide 16-20 graduate fellowships in BCS each year. Recipients of these awards will be known as the Henry E. Singleton (1940) fellows.

The gift comes at an opportune time, as we have faced significant challenges in graduate funding recently. Our graduate program has increased to 80 students this year, all of whom are fully supported by some funding mechanism or combination of funds. Yet almost no source of funding covers the full cost of a MIT education, and has to be supplemented by the BCS general budget. Recent budget limitations at MIT contributed to a funding shortfall last year. The new fellowships, together with the other pieces of our graduate funding quilt -- NIH training grants, research and teaching assistantships, individual fellowships and other fellowships from gifts -- ensure that our graduate program can grow, as we continue to seek funds to counter any future decreases in federal programs or the MIT budget.

THE OTHER SIDE OF BCS FACULTY

SUE CORKIN CLIMBS MT. KILIMANJARO



Professor Suzanne Corkin and her guide Freddy Chikema at Uhuru Peak

On September 27, 2004 at 9:30 AM Sue successfully climbed Mt. Kilimanjaro, the highest peak in Africa, right to the summit, Uhuru Peak (19,340 ft.). Sue said it was intense: by far the most difficult physical challenge she has ever undertaken. The adjectives "extreme" and "treacherous" are not overstatements. She stayed at the summit for over an hour and felt wonderful.

At right: Professors Potter, Adelson, and Seung investigate their space in the new building

TED GIBSON ROWS IN HEAD OF THE CHARLES REGATTA



Ted Gibson (second from left facing forward) and his team

Ted rowed with his 1986 Cambridge University rowing crew (beat Oxford, won some other races back then). The whole crew from 1986 came over to row in the Masters 8 event as "Crabtree Boat Club", which is a club for Cambridge/Oxford alumni. They finished 8th of 31 and Ted was at 7 seat (second from the stern).





BCS PARTICIPATES IN THE ALZHEIMER'S ASSOCIATION MEMORY WALK FOR THE 4TH YEAR



BCS Team Lebensalter raised \$2,218, the largest sum they have ever raised. Team members: Back row (l to r): Alice Wu, Brandon Farley, Dana Ross, Katy Davis, Manuel Dominguez-Rodrigo, Mary Prendergast, Jodi Davenport, Winston Chang, Orla McAleer, Amie O'Dowd, Ronan O'Dowd. Bottom Row (l to r): Cindy Xi, Sandhya Sitaraman, Christine Fanchiang, Amy Pooler (captain), Sarah Hall, Ronan Flynn, Keith Thoresz. (Not pictured: Judy Rauchwarger)

UNDERGRADUATE AWARDS DINNER



Top Row (l to r): Melanie Cornejo '05, Izzat Jarudi, '04, Michelle Machon '04, Caitlin Schein '04, Martin Kurtev, '04, Sidharth Puram '05, Kimberly Kempadoo '05, Farhan Merali '05. Front Row (l to r): Mariko Jameson '04, Irit Rappley '04, Sarah Laszlo '04, Anna Holt '05.

GRADUATE DEGREES

Jeff Cottrell, PhD '04, in Neuroscience is now a Research Associate at MIT.

Serkan Oray, PhD '04, in Neuroscience is the Medical Science Liaison for UCB Pharma.

Deepa Iyengar, SM '04 in Brain and Cognitive Sciences, is an artist working on a series of large-scale digital images and developing a model of intonation generation for text-to-speech systems.

Charlene Ellsworth, PhD '04 in Neuroscience, is a medical student at Washington University

Gail O'Kane, PhD '04 in Cognitive Science

Toshimasa Sakamoto, PhD '04 in Neuroscience, is a Postdoctoral Associate at MIT.

AWARDS AND HONORS

FACULTY

Suzanne Corkin is celebrating her 40th year at MIT.

Ann Graybiel received the Radcliffe Alumnae Achievement Award and the National Parkinson Foundation "Women Leaders" Award.

Neville Hogan received a silver medal from the Royal Academy of Medicine in Ireland.

Nancy Kanwisher was awarded the Ellen Swallows Richards Professorship.

Carlos Lois received the Ellison Foundation Young investigator award (2004-2008)

Tomaso Poggio was presented the Gabor Award by the International Neural Network Society.

Molly Potter was elected a member of the Society of Experimental Psychologists.

Pawan Sinha was promoted to Associate Professor.

Gerald Schneider was appointed as an honorary professor at the University of Hong Kong.

Mriganka Sur was appointed to the Advisory Council of the National Eye Institute/NIH.

Matthew Wilson and Sebastian Seung were promoted to full professor.

GRADUATE STUDENTS

Tom Griffiths, of Josh Tenenbaum's lab, received an honorable mention for the Marr Prize.

Outstanding Thesis Awards went to David Freedman, Ph.D. 2002, Elizabeth Kensinger, Ph.D. 2003, Rebecca Saxe, Ph.D. 2003, and James Schummers, Ph.D. 2003.

UNDERGRADUATE STUDENTS

Swati Maria Saini '05 and Laurel Yong-Hwa Lee '05 were named to Glamour magazine's Top 10 College Women list. Swati was recognized for her work helping people with diabetes and for her achievements as a Truman Scholar, vice president of the Society for Women Engineers, cheerleader, and campus EMT (Emergency Medical Technician). Laurel was recognized for her groundbreaking research on the immune response and for coordinating medical care for 11 women's shelters and orphanages in Honduras.

Irit Rappley '04 was awarded the Association of MIT Alumnae (AMITA) Senior Academic Award given to the senior women who have demonstrated academic excellence through coursework and related professional activities.

Izzat Nabil Jarudi '04 and Sarah Laszlo '04 were elected to Phi Beta Kappa.

Walle Nauta Award for outstanding research in brain and cognitive sciences was given to Michelle Machon '04 and Irit Rappley '04.

Hans-Lukas Teuber Award for outstanding academic achievement in brain and cognitive sciences went to Mariko Jameson '04, Izzat Jarudi '04, Martin Kurtev '04, Sarah Laszlo '04, and Caitlin Schein '04.

Honorable Mention for leadership in the BCS Society went to Kimberly Kempadoo '05.

Honorable mention for excellent work in a particular subject went to Anna Holt '05.

Honorable mention for outstanding academic record was given to Melanie Cornejo '05, Farhan Merali '05, Sidharth Puram '05, and Lara Rogers '05.



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of **Mriganka Sur's** lab, were able to demonstrate that the adult brain is more plastic than believed through their work with mice that were "rewired" to receive visual cues in the auditory region of their brains. This could eventually allow people whose brains were damaged in one region to receive the stimuli normally received there in other regions of their brain. This work also showed that a brain structure responsible for an emotional response can accept information from unusual sources and learn from a novel association. Research Scientist **Tsuyoshi Miyakawa** of **Susumu Tonegawa's** laboratory helped design the behavioral paradigm for the research. This study appeared in the Sept. issue of *Nature Neuroscience*.

Ruth Rosenholtz, a Principal Research Scientist, together with **J. P. Lewis** of USC, **Nickson Fong** from ESC Entertainment, and **Ulrich Neumann** of USC have developed a system -- dubbed **VisualID** -- to automatically generate visually distinct icons for representing files on a computer, to make it easier for people to find a file they are looking for. It's basically applied visual search -- given what we know about human visual search capabilities, how would you design a computer tool to take advantage

of these capabilities? In addition to file management, the icons system could be used for systems like air-traffic control. An article about their work appeared on Sept. 15 in the online version of *Technology Research News*, and MIT's own *Technology Review*, which will do a brief story in January, and in their current newsletter. They have also gotten requests for interviews from CNET.

Menicon Professor of Neuroscience Morgan Sheng and **Postdoctoral Fellow Sung Hyoung Lee**, found that a glutamate receptor designated **GluR2** is in charge of directing postsynaptic glutamate receptors (i.e., AMPA receptors) from the cell surface to the inside of the cell. AMPA receptors allow information to flow between neurons and, when they are moved from the cell surface into the cell depths, synapses weaken. Sheng and Lee determined how this movement is governed. In the July issue of *Neuron*, they explain how **GluR2** works to alter the recycling and breakdown of AMPA receptors after they move to the internal region of the cells. Being able to manipulate **GluR2** may enable them to get more receptors to the surface of the synapse and ultimately boost brainpower in the hippocampus, where longterm memories are stored.

Earl Miller instructs Jefferson Roy and Christopher Irving in the art of croquet at the BCS Summer Social



Everyone is on deck as the fall cruise sets sail

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BCS Welcomes New Grad Students

Viren Jain was born in India and raised in New Jersey. He recently graduated from the University of Pennsylvania, where he studied both computer science and cognitive science. At MIT, he is interested in computational neuroscience and machine learning, but is open to other things. Viren enjoys music of many types, drumming, good conversation and company, and will read anything that's about eight pages long.

John Kraemer majored in math at the University of Texas. Since then, he has earned a living programming, teaching high school, and occasionally making pizza. He's interested in computational models of higher cognition (both fuzzy and neat) and hopes to someday work in either academia or consulting making computers do surprising things. He enjoys strategy games, riding his bike, working too much, and watching movies in good company.

Ethan Meyers is from Hudson, N.Y. and received his undergraduate degree in computer science from Oberlin College. Since graduating in 2002, he has been working for **Pawan Sinha** doing computational and neuroimaging research. His interests in the department include machine learning, computational neuroscience, and human/machine vision. His long range plans are to either be a professor, researcher, and/or a rockstar. When not trying to figure out how the brain works, he enjoys traveling, playing volleyball, rooting for the Red Sox, and playing the guitar.

Dominique Pritchett was raised in Seattle, Washington, and attended Virginia State University. He is at MIT to

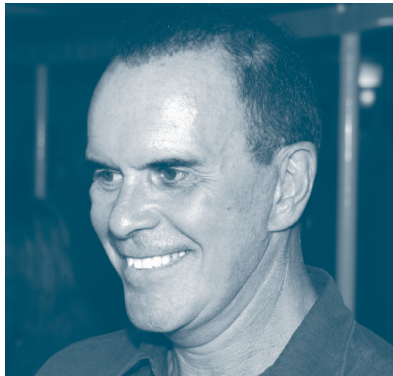
become a systems neuroscientist, though after spending much of his time tutoring, he decided that the role of an educator/mentor would be a way to inspire others, especially minorities, to pursue a degree in science. He would like to focus on minorities because they are underrepresented not only professionally in the sciences, but also in clinical trials. He likes to find new things to be hooked on and, currently, has a dilettante's interest in photography, and enjoys listening to music from musicians new to him.

Ethan Skowronski-Lutz grew up in Plano, TX. He studied for a year in St. Petersburg, Russia and then attended the College of the Holy Cross in MA, where his work focused on neurosteroids and neurosteroidogenic agents. His present research interests include the broad principles of abstract neural encoding and representation, particularly those that can be gleaned from systems level research. He also enjoys philosophy of ethics, epistemology, armchair physics, hiking, and dog training and breeding.

David Ziegler, originally from Monroe, MI, earned an undergraduate degree in psychobiology at Denison University in Granville, OH. For the past several years he has been working at the Center for Morphometric Analysis at MGH, and his recent research focused on brain development in children with autism and related language disorders, using MRI-based morphometry. He is also interested in applied statistics and research design. He sees his future in an academic setting, where research, teaching, and mentoring go hand in hand. Much of his spare time is spent with his dog Swiffer, but he also enjoys sailing, skiing, live jazz, classical concerts, and wine-tasting.



RICHARD WURTMAN



Despite Dick's seemingly endless travels throughout the world, he was a resident of Philadelphia until he finished his undergraduate studies at Penn, and he has been in Boston ever since, with the exception of 4 years spent at the NIH. He is the son of a lawyer and a piano teacher, and his early interests were in debating and public speaking. At age 7, he was on a radio show called the Quiz Kids, a program featuring precocious children who, these days, would do well on Jeopardy. He was also one of his mother's youngest piano students, and today he still enjoys playing classical music and improvising.

Dick was pre-law until his junior year at Penn, and his particular interest was the philosophy of history (especially the historical analysis of why some things happen and others don't). However, the summer prior to his senior year, he met a medical student from Columbia who was also doing research, and this inspired him to focus on the relationship between the mind and brain from a biochemical perspective (it is also a major philosophical question). Suddenly, he decided to apply to and was accepted by Harvard Medical School despite having only one college course in biology. He aspired to either discover something or ameliorate human suffering.

At HMS, there was a dean dedicated to encouraging medical students to do summer research projects, and Dick began to work on the pineal gland about which nothing was known at the time. He continued this project in his spare time once classes resumed. During his second year, he also became involved with a project that was trying to understand how adrenalin makes people anxious. He would inject adrenalin into pigeons, place them in Skinner boxes, and study their behavior. During this period he also met and eventually married a Wellesley College student, Judith Hirschhorn,

who was working at Harvard as a summer technician. By the time he graduated, he had a new wife and a bibliography of his own publications. However, Dick liked working with patients and was unclear as to which path to follow: doctor or scientist. He decided upon training in both, and did an internship and residency at MGH, followed by a 2 year postdoctoral position at the NIH, where he discovered that melatonin is a hormone secreted when it's dark and is controlled by the brain. He then returned to MGH for additional training in endocrinology and neurology before spending another 2 years at the NIH. This was followed by an appointment at MIT, where he has been ever since.

At the NIH, his initial thought was to train in neuroendocrinology, but he had an idea that neurotransmitters might be important. In those days, neuroscience was essentially limited to neuroanatomy and neurophysiology because people had not yet figured out how to study brain chemicals like neurotransmitters and, also, there were virtually no drugs that acted upon these compounds. He decided to work with a mentor, Julius Axelrod, who had been a technician until getting his Ph.D. at age 47. When Dick met him, Axelrod had just discovered uptake, the way most neurotransmitters are turned off, for which he was awarded a Nobel prize 8 years later. Dick spent 2 years at the NIH learning the biochemistry and pharmacology of the brain, and also determined that the position of the adrenal medulla inside the adrenal cortex allows cortisol from the adrenal cortex to control the production of adrenalin in the medulla. This had considerable clinical implications and, based on his discoveries, he was offered a number of positions.

He was attracted to MIT in part because Prof. Hans-Lukas Teuber told him that MIT allowed its faculty to do anything, as long as it works, and because MIT, as oriented as it was to engineering, seemed more committed than most institutions to translational

research. Soon after arriving, he met Hamish Munro, believed to be the world's greatest nutritional biochemist. Munro had just discovered that levels of the amino acid tryptophan controlled protein synthesis in the liver. Dick wanted to see if these levels also controlled the ability of brain cells to make a product of tryptophan called serotonin. They did, and Dick went on to find that the production of several important neurotransmitters and other brain chemicals also depends on the amounts of their circulating precursors. Working this phenomenon out and asking how it can be used has occupied himself and many of his associates for many years.

Because Dick's original MIT appointment was in the Dept. of Nutrition and Food Sciences, and because he knew nothing about nutrition then, he hired his wife to help him design experiments. Judy had done her Ph.D. thesis in cell biology at MIT and, eventually, a postdoc in nutrition. While he focuses primarily on the lab, Judy has spent most of her time applying some of his results in the Clinical Research Center. The two have been collaborating for 25 years.

Dick and Judy are also the parents of a son, David, who abandoned his medical degree to get an MBA, and is now working for a biotech company in San Francisco. Their daughter, Rachael, a non-practicing attorney, is now taking a degree in infant development, perhaps inspired by her 3 children. These days, one can also catch a glimpse of Dick with Simon, his longhaired miniature dachshund.

Dick's hobbies include music: both playing and attending concerts. He is also an overseer of the BSO, a trustee of the Provincetown Art Association, and active in several charities. After 28 or 30 years as a self-proclaimed couch potato, he took up running to keep up with Judy and his children, and also works out at a gym 5 days a week. He keeps telling himself he likes it.



Nancy Kanwisher, Molly Potter, Ted Adelson, Yuanzhen Li, Aude Oliva, and Lera Boroditsky put aside thoughts of work to enjoy the summer social and barbecue in June



ALUMNI NEWS

Thad Starner, SB '88 in BCS and EECS, Ph.D. '99 in Media Arts and Sciences, is an Assistant Professor in Georgia Tech's College of Computing, where he founded and directs the Contextual Computing Group. In 1993, he created one of the earliest high-accuracy on-line cursive handwriting recognition systems, and has authored over 70 scientific publications in mobile computing, computer vision, augmented environments, and pattern recognition. Starner co-founded the IEE International Symposium on Wearable Computers and is one of the founding members of the IEEE Technical committee on the subject. He is also a founder of the MIT Wearable Computing Project and Charmed Technology. His work includes a gloveless, real-time sign language recognizer; various intelligent agents in support of everyday memory; theoretical frameworks for power generation and heat dissipation for wearables; several augmented realities; and a computer-vision based interactive workbench for which he received a "best paper" award at VR2000. Thad's current work researches the use of computational agents for everyday-use wearable computers. The photo at the right shows him wearing one of his computers.



Thad Starner

Jill Gaulding, SB '88, planned to become a linguistics professor and finished two years toward her Ph.D. in Linguistics and Philosophy at MIT, when she decided to change careers. After 2 years of teaching 7th grade science in N.Y.C. as a member of the "Teach for America" volunteer program, she entered Cornell University and received her JD in 1995. She ranked first in her graduating class and served as articles editor of the Cornell Law Review. She was a judicial clerk for Judge Sandra L. Lynch, U.S. Court of Appeals for the 1st Circuit and subsequently she worked at a Boston law firm specializing in employment law, particularly the law regarding equal opportunity and discrimination. Ultimately, she returned to academe, teaching at the University of Iowa College of Law. Her MIT training, by teaching her to think like a scientist, helped her research and publications dealing with language discrimination issues and subconscious bias.

William Marslen-Wilson, Ph.D. '73 in Experimental Psycholinguistics, a Fellow at Wolfson College, Oxford, is Director of the MRC Cognition and Brain Sciences Unit and part of its Speech and Language program, which is concerned with the study of human language as a cognitive, computational, and neural system. The goal of their research is to explain how normal adults understand language. Most of the research focuses on how people can recognize words in spoken language, and on how we understand and represent the meanings of those words. Their research uses techniques

from experimental cognitive psychology, as well as new technologies for tracking the activity of the brain during language comprehension and production (PET, fMRI, EEG). They emphasize developing computational models of the cognitive processes involved in processing language. Much of the work also involves comparisons between different languages (cross-linguistic research) and studies of clinical populations. This latter group includes deaf patients fitted with a cochlear implant, and individuals with neuropsychological impairments.

Brad Postle, Ph.D. '97, is an Assistant Professor in the Department of Psychology at the University of Wisconsin. His lab is interested in human memory cognition, encompassing the cognitive and neural bases of working memory, attention, control, intelligence, and nondeclarative memory. Topics motivating recent and current research include: the mediation of proactive interference in working memory; the relations between measures of working memory span, executive control, and general fluid intelligence; the mental codes underlying visual working memory function; the neural bases of working memory storage; age-related differences in working and short-term memory performance; and the neural bases of pattern priming in Alzheimer's disease. Experimental methods employed in the laboratory include functional magnetic resonance imaging (fMRI), behavioral testing with eye movement monitoring of healthy young adults, healthy elderly adults, and neurological patients, and fMRI-guided repetitive transcranial magnetic stimulation (rTMS). On a personal note, he and his wife are the proud parents of a son and daughter.

brain+cognitive sciences

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