Appointments & Honors

Crick–Clay Professorship

In 2005 Landon and Lavinia Clay provided funding for a position at Cold Spring Harbor Laboratory, the Crick–Clay Professorship of Mathematics. The position has two aims: to honor the memory and achievements of Sir Francis Crick and to promote fruitful interaction between biology and mathematics.

The first person to hold the Crick–Clay Professorship is Dr. Carlos Brody. Brody, a native of Mexico, received a BA in physics from Oxford University in 1988, MSc from Edinburgh University in Artificial Intelligence in 1990, and a PhD in Computation and Neural Systems from Caltech in 1997. Among his honors is a Sloan Fellowship (2004–2005). Since 2001 he has been on the faculty of the Watson School of Biological Sciences at Cold Spring Harbor Laboratories.

Brody's current work centers on mathematical models of short-term memory and decision-making. In experimental psychology, short-term memory and decision-making are often studied with a task form known as "two stimulus-interval discrimination": Subjects are presented with a first stimulus (which we shall call "A"); a brief delay of a few seconds ensues; subjects are presented with a second stimulus ("B"); finally, subjects are asked to report the outcome of a binary decision based on the comparison of the two e.g., was A greater than B? Yes or No. In order to carry out this task correctly, subjects must use short-term memory to remember A through the delay between the first and the second stimulus. It is thought that the neural substrate of this short-term memory is in the form of a pattern of neural activity that is stable throughout the memory period. Different patterns of activity correspond to different remembered values of A. From a dynamical-systems perspective, to each value of A there corresponds a stable point. If there is a continuum of possible A values (for example, when the stimulus is the frequency of a pure tone), then the neural dynamics must implement, or approximate,

a continuum of stable points – a "line attractor." In collaboration with experimental researchers who record from brains of animals trained to do two stimulus-interval discrimination tasks, the questions we ask are these: How can neural systems form such line attractors? In general, line attractors are fragile to perturbations. How can robustness be achieved? And, how can information stored in line attractors be used for decision-making?

2005 Olympiad Scholar

Sherry Gong, a 10th grade student at Phillips Exeter Academy, was named the 2005 Clay Olympiad Scholar at a ceremony in Washington, DC, on June 27, 2005.

The Clay Olympiad Scholar Award recognizes the most original solution to a problem on the US American Mathematics Olympiad (USAMO). It consists of a commemorative plaque, a cash award to the recipient, and a cash award to the recipient's school. The award is presented each year at the official awards dinnner for the USAMO, held in June in Washington, DC, at the State Department Ballroom.

2005 Olympiad Scholar – continued

Sherry Gong, daughter of Guhua Gong and Liangqing Li of San Juan, Puerto Rico, attended schools in Puerto Rico until 2005 when she enrolled at Philips Exeter Academy in Exeter, New Hampshire. Sherry attended a mathematics olympiad for the first time when she was in the sixth grade — the 3rd Olympiada Matematica de Centroamerica y el Caribe. There Sherry received a silver medal and a special award for the most original solution. It was the first such award in the history of that olympiad. Sherry received a silver medal the next year at the same olympiad. In 2003, she received a gold medal at the XVIII Olympiada Iberoamericana de Matematicas. She also received a bronze medal in the 44th IMO (2003) and a silver medal in the 45th IMO (2004).

In addition to mathematics, Sherry is interested in physics and computer programming. She won a position in the 24-member USA Physics Olympiad Team (2005). Sherry enjoys seeing the connection between physics and mathematics, and she likes to find her own solutions when given a math or physics problem.

Sherry won the State Championship for the Geo Bee and represented Puerto Rico in the National Geo Bee in Washington, DC (2002). She also likes karate, poetry, and reading.

The Prix Fermat Junior

Clay Research Academy student Igor Kortchemski won the Prix Fermat Junior for the work he began at the Academy. See http://shadowlord.free.fr/articles/fr_goodsf4f1.pdf

Harvard Traveling Fellow Jonathan Bloom

Jonathan Bloom graduated from Harvard College in 2004 with high honors in mathematics and a Harvard fellowship to travel the world for one year. He used this opportunity to examine how mathematics is taught and learned in other cultures, guided by the belief that, by looking abroad, those wishing to improve math education in the United States can better identify and evaluate their own assumptions.

With digital video equipment, software, and support provided by CMI, Jonathan began his travels at the 10th International Congress on Mathematical Education in Denmark and the 45th International Mathematics Olympiad in Greece. He then journeyed through Botswana, Israel, Thailand, Singapore, Japan, Australia, New Zealand, and Brazil. Along the way, Jonathan recorded primary, secondary, and teacher-education classes as well as interviews with students, teachers, mathematicians, and leaders in education. He also spent three months as a secondary school teacher in Botswana, where he found his students to be universally adept at arithmetic (few calculators!) but often challenged by more algebraic thinking.

Throughout the year, Jonathan got to know many mathematicians who, in addition to doing important research, were dedicated to improving the quality of math education in their countries. Inspired by their passion for both mathematics and teaching, he will begin the doctoral program in math at Columbia University in September, specializing in topology and geometry. He hopes to embark on an academic career of research, teaching, and direct involvement in math education.