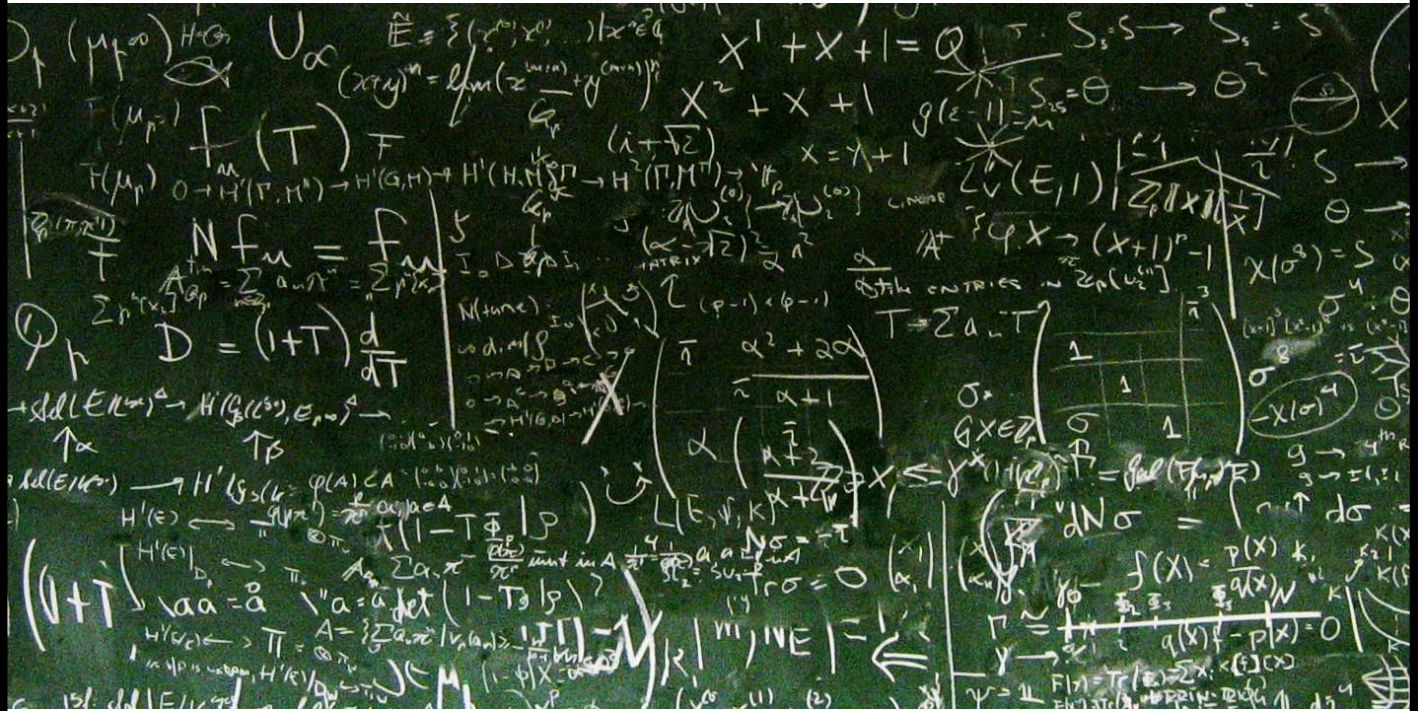




JOHNS HOPKINS
CENTER for TALENTED YOUTH

Science and Technology Series



Johns Hopkins University

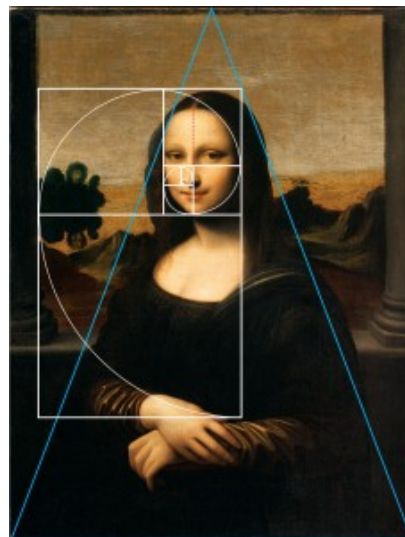
Mathematics

Saturday, March 4, 2017

Morning Keynote

The Mathematics of Aesthetics: Leonardo and the Intersection of Mathematics and Art

Bulent Atalay presents mathematics through art, and art through mathematics. He invokes the model of Leonardo da Vinci in approaching the larger goal of achieving a synthesis of the two fields. The creator of the two most famous works in the history of art, Leonardo was actually just a part-time artist, displaying an insatiable curiosity as scientist and inventor. The qualities of timelessness and universality in Leonardo's miraculous works speak eloquently for themselves. With Leonardo's model providing the unifying thread, however, it becomes possible, first, to glimpse Leonardo's restless intellect, that extraordinary psyche; second, to see whence the ideas for his works of art came; and ultimately to appreciate his art at a different level.



Presenter Bulent Atalay is a scientist, artist, and author. Described by NPR, PBS, Smithsonian and the Washington Post as a “Twenty First Century Renaissance Man,” he is the author of two best-selling books on the intersection of art, science and mathematics. He has taught at the University of Mary Washington, the University of Virginia, and served as a member of the Institute for Advanced Study in Princeton. Atalay received his education in mathematics and theoretical physics at a number of universities — Georgetown, UC-Berkeley, Princeton and Oxford. His best-selling book, *Math and the Mona Lisa*, has appeared in thirteen languages. His last book, *Leonardo's Universe*, was the one of “10 Must-have books for 2009.” Atalay has given keynote lectures for CTY during a dozen years spanning 2000-2012. Having retired from academia, he travels around the world lecturing at universities and on ships of the Crystal and Seabourn Cruise Lines. For more details, visit www.bulentatalay.com

Morning Breakout Sessions



Play the Game, Not the Player

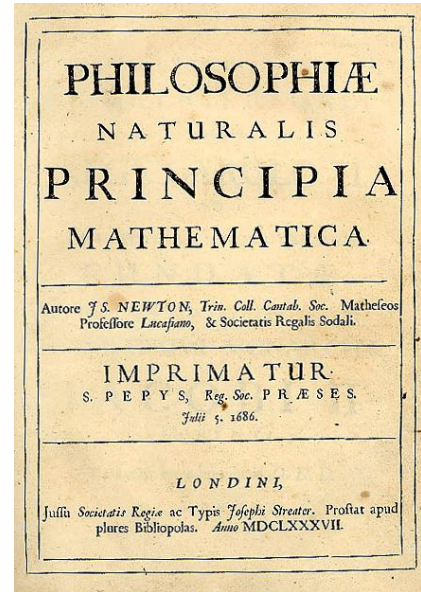
What makes a game ‘fair’? How can you tell if you should go first when you play a new game? Is poker a game of skill or chance? If it’s a game of chance, is there a ‘best’ way to play? Over the course of an hour, we’ll talk (and play) a variety of games, figure out winning strategies, and learn how to answer these questions for any 2-person game we may encounter.

Presenter: Tim Tennant, Assistant Program Manager, CTY Summer Programs

The Aesthetics of Mathematics — Newton and the Miracle Year

Isaac Newton, who lived between 1642-1727, was quite simply the greatest mathematician and scientist in history. Although a reclusive and irascible man who we probably would not have liked if we met him, he is ironically the architect of the modern age. The year he graduated from Cambridge University in 1665, the Bubonic plague struck England and closed down the country's two great universities. During the following year, when he was sequestered in his home in village, he made the discoveries in mathematics and physics that marks the year as the "Annus Mirabilis" (Miracle Year). He was 23 years old. Another 23 years later, he sat down and wrote it out as a three-volume book which forever changed the world. We will examine the binomial theorem, just one of his mathematical discoveries in the miracle year along with a number of its applications, including in the formulation of calculus and Einstein's relativity.

Presenter: Bulent Atalay



Afternoon Keynote

The Numbers Game: Analytic Methods in Sports



We are in the Golden Age of applying technology, analytics and innovation to virtually all aspects of sports. In this talk, Dr. Dahbura will present some of the work of a group of faculty and students in the Whiting School of Engineering in the areas of sports season scheduling optimization for minor-league baseball, and various sports analytics problems.

Presenter Anton (Tony) Dahbura received the BSEE, MSEE, and PhD in Electrical Engineering and Computer Science from the Johns Hopkins University in 1981, 1982, and 1984, respectively. From 1983 until 1996 he was a researcher at AT&T Bell Laboratories, was an Invited Lecturer in the Department of Computer Science at Princeton University, and served as Research Director of the Motorola Cambridge Research Center in Cambridge, Massachusetts. Since 1996 he has led several entrepreneurial efforts in the areas of printing professional baseball operations and commercial real estate. In January, 2012 he was named Executive Director of the Johns Hopkins University Information Security Institute in Baltimore. From 2000-2002 he served as Chair of the Johns Hopkins University Engineering Alumni and in 2004 was the recipient of the Johns Hopkins Heritage Award for his service to the University. He chaired The Johns Hopkins Computer Science Department Advisory Board from 1998 until 2012 and also served on the Johns Hopkins University Whiting School of Engineering National Advisory Council during that time.

Afternoon Breakout Sessions

The Mathematics of Juggling

Juggling has been around since the Ancient Egyptians. In the mid-1980s, an entirely new set of moves was discovered using fairly simple mathematics. Joe DiNoto is a CTY Online mathematics instructor and juggling enthusiast who is interested in the mathematics used to model the different theoretical and practical patterns in a juggler's repertoire. In this presentation, he will share the mathematics of juggling, demonstrate advanced patterns, allow you to create and discover your own patterns - and even show you how to get started with juggling!

Presenter: Joe DiNoto, AP Calculus & AP Statistics Supervisor, CTY Online Programs



Mathematical Origami: Math in Motion

When is an origami crane more than just an origami crane? How many different markers do you need to color a map so that no two countries that share a border are the same color? The mathematics of origami and map coloring collide in this hands-on workshop. You will learn to make a simple paper crane, unfold it to analyze the crease pattern from a mathematical point of view, and then add some color to get an unexpected result.

Presenter: Amber Wagner Gaines, Program Manager, CTY Summer Programs

Program Schedule

8:30 – 9:00 a.m.

Check-In

Location: Hodson 2nd Floor Lobby

9:00 – 9:15 a.m.

Welcome and Opening Remarks

Location: Hodson 210

Presenter: Brian Fitzek

9:15 – 10:00 a.m.

Morning Keynote Address

Location: Hodson 210

Presenter: Bulent Atalay

10:00 – 11:00 a.m.

Breakout Session One

The Aesthetics of Mathematics

Location: Hodson 305

Presenter: Bulent Atalay

Play the Game

Location: Hodson 313

Presenter: Tim Tennant

11:00 a.m. – 12:00 p.m.

Breakout Session Two

The Aesthetics of Mathematics

Location: Hodson 305

Presenter: Bulent Atalay

Play the Game

Location: Hodson 313

Presenter: Tim Tennant

12:00 – 1:00 p.m.

Lunch

Location: Hodson 2nd Floor Lobby

1:00 – 1:45 p.m.

Afternoon Keynote Address

Location: Hodson 210

Presenter: Anton Dahbura

1:45 – 2:45 p.m.

Breakout Session Three

Mathematical Origami

Location: Hodson 305

Presenter: Amber Wagner Gaines

The Mathematics of Juggling

Location: Hodson 313

Presenter: Joe DiNoto

2:45 – 3:45 p.m.

Breakout Session Four

Mathematical Origami

Location: Hodson 305

Presenter: Amber Wagner Gaines

The Mathematics of Juggling

Location: Hodson 313

Presenter: Joe DiNoto

3:45 – 4:15 pm

Student Roundtable

Anthony Karahalios - Class of 2017

Actuarial Science Club

Neil Gahart - Class of 2018

Sports Analytics Club

Gabby Liflander - Class of 2018

Society of Women Engineers

Emily Ramos - Class of 2018

Society of Hispanic Professional Engineers,

Marketing and Business Analyst Internships

4:15 – 4:30 p.m.

Closing Remarks and Evaluations