conference.program

3.31.16

9am

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| Title | Presenter Notes |

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| **PDR 1 + 2** | with Emily Zhang | |
| Understanding the Twin Paradox Through Relativity | Jessica Pointing 014 \* | |
| Minimax - How to Use Randomness to Make Decisions | Connor Sell 115 \* | |
| What Makes a Rainbow? | | Ethan DiNinno 14 \* |
| Quantum Mechanics: The Cool Thing To Do | | Justin Xiao 14 \* |
| How to Win at Strategy Games | Kevin Wen 016 \* | |
| **Twenty Chimneys** | with Professor Muriel Medard | |
| Reading Our Genes: Sequencing DNA | Bryce Hwang 02 \* | |
| Zoom vs Distance | Ivan-Tadeu Ferreira-Antunes-Fil 02 \* | |
| Lies, Damned Lies, and Bayesian Probability | | Benny Zhang 2 \* |
| Flashing Lights, Action Movies, and Opera Singers | Antoine Nasr 02 \* | |
| The Hodgkin-Huxley Model and Making Friends | Anita Liu 02 \* | |

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| **Mezzanine Lounge** | | with Francis Chen |
| Netflix & Filtering: Recommender Problems | Sitara Persad 117 \* | |
| Animate Cloth and Hair Realistically | | Jared Counts 17 \* |
| How Does Facebook Work? | | Matthew Guthmiller 17 \* |
| How your password stays secret (when your computer is stolen!) | | Max Justicz 14 \* |
| HOX Genes: How to Reverse Engineer a Dinosaur from a Chicken | | Kamilla Tekiela 14 \* |

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| **Coffeehouse Lounge** | with Alex Chumbley & Dr. Jason Miller | |
| The human ear & radio: what they have in common | Eric Fegan 11 \* | |
| Approximating Pi Using Toothpicks: The Buffon Needle Problem | | Sarah Shader 11 \* |
| How Devices on the Internet Communicate: Finding Paths through a Complex Network | Francesca Cicileo 12 \* | |
| How to Get to Space: Rockets, Engines, and Staging | Nicholas McCoy 013 \* | |
| (no title) | Angel Carvajal 010 \* | |

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| **PDR 4** | with Virginia Chiu | |
| One Bit Two Bit, Red Bit Qubit: Understanding Quantum Computers | | Matt Basile 12 \* |
| Saving Time with Shortest Path Algorithms | | Antonio Rivera 13 \* |
| Cashing Cache: A Computer's Short Term Memory | | Emily Benz 13 \* |
| Public-Key Cryptography: Sending Secrets the Hard Way | | Kevin Kusch 12 \* |
| Passing Messages Over the Internet | | Asya Bergal 012 \* |

10am

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| Title | Presenter Notes |

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| **PDR 1 + 2** | with Professor Tim Lu |
| How to kick your friends off the Internet: DDoS ins and outs | Everardo Rosales 3 \* |
| Image processing - standing out against the background | Rebekah Cha 3 \* |
| How Not to Gamble | Or Oppenheimer 3 \* |
| How to work well with friends | Hongyi Shi 3 \* |
| (no title) | Alexander Stewart 3 \* |

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| **Twenty Chimneys** | with Professor Muriel Medard |
| How Light Enters the Brain | Amanda Liu 07 \* |
| How Computers Talk | Emily Armstrong 07 \* |
| (no title) | Kevin Kwok 07 \* |
| (no title) | Kevin Li 07 \* |
| What is the fastest way to get around town? | Adrian Mora 07 \* |

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| **Mezzanine Lounge** | | | with Francis Chen |
| Why We Can't See Through Walls | | | Devin Morgan 7 \* |
| Electric Motors: Turning Electricity into Motion | | | Aaron Rose 7 \* |
| Black Holes: A Better Chance of Escaping Alcatraz | | | Thomas Harris 17 \* |
| Making The Unknown Known | | | Kathleen Johnson 17 \* |
| Interrupts: Ways to Manage Different Hats | | | David Kang 17 \* |
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| **Coffeehouse Lounge** | with Alex Chumbley | | |
| Keeping Things In Control | Sara Sinback 1 \* | | |
| Where am I?: Determining Your Location with Your Phone | | Andrew Titus 3 \* | |
| How Do Airplanes Fly? | Alice Zielinski 3 \* | | |
| Ordering Pizza and Reliable Communication | Sen Chang 11 \* | | |
| Fuzz Testing: Using Monkeys to Find Problems | Lynda Tang 11 \* | | |
| **PDR 4** | with Professor Sangeeta Bhatia | | |
| Making Medicine Efficiently: How to Make Cells Do what You Want | Camilo Ruiz 1 \* | | |
| Predicting the Future: Markov Chains | John Brown 1 \* | | |
| Light Switches and Cheat Codes: One Step at a Time | Timothy Higgins 1 \* | | |
| Be Proactive in Dating: The Mating Algorithm Says So | Eric Lau 1 \* | | |
| How to Turn Atoms into an Atomic Clock | | | Catherine Medlock 1 \* |
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11am

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| **PDR 1 + 2** | with Professor Tim Lu |
| Words as vectors: analogies for computers! | Hairuo Guo 4 \* |
| How Drugs Work: What Goes on Inside the Brain | Jasmeet Arora 4 \* |
| Magnets, How do They Work? | Kevin Chan 4 \* |
| Can you see my heart beating? Understanding Electrocardiogram | Heejo Keum 4 \* |
| Cycle Detection: Am I walking in Circles? | Heeyoon Kim 4 \* |

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| **Twenty Chimneys** | with Professor Muriel Medard |
| Sharing is Caring: Torrents Demystified | Julia Guo 08 \* |
| Turning the real world into 1's and 0's | Amelia Becker 08 \* |
| Principles of 2D Printing | Tucker Cheyne 08 \* |
| Tricking users into unintentionally displaying your website. | Will Haack 08 \* |
| How to make electricity with a copper tube and a magnet | Hau Lian 08 \* |

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| **Mezzanine Lounge** | | | with Nick Uhlenhuth\* |
| How the Duck does Autocorrect Work? | | | Tilly Taylor 13 \* |
| Fitting More Music on your iPod Using Fourier Transforms | | | Stephanie Pavlick 8 \* |
| Not All Infinities Are Created Equal | | | Gerrod Voigt 16 \* |
| Hard problems are hard | | | José Velarde 16 \* |
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| **Coffeehouse Lounge** | with Alex Chumbley | | |
| Springy Thingies Turned Digital: Cloth Simulation in Computer Graphics | Emily Van Belleghem 4 \* | | |
| How to Make a "Stupid" Proof | Cristina Mata 4 \* | | |
| Coding and Cooking | Phillip Ai 12 \* | | |
| Radio Jamming and how to Protect Against it | Alex Huang 11 \* | | |
| How Does the Internet Know You Are Human? | Roberto Soto 12 \* | | |

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| **PDR 4** | with Professor Luís Velásquez-García |
| Quantum Tunneling | Mahmoud Ghulman 10 \* |
| Zero-Knowledge Proof: A Proof without The Real Proof | Laponchai Jirachuphun 10 \* |
| How to Hide Your Identity Online | Victor Lopez 16 \* |
| PID Controllers: boat steering and moon landing | Vahid Fazel-Rezai 15 \* |
| Bézier Curves: How a Simple Plan Wins | Kenny Friedman 15 \* |

12pm

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| Title | Presenter Notes |

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| **PDR 1 + 2** | with Professor Tim Lu |
| Gravitational Waves - Ripples in Spacetime | Jason Liang 5 \* |
| Teach computers to filter spam: a mathematical approach | Blake Elias 5 \* |
| Candy Queues: Explaining Internet Access with a Candy Factory | Jeremy Ellison 5 \* |
| Curing Cancer with Living Drugs | Margaret Guo 5 \* |
| How your fitness trackers find your Heart Rate | Zixi Liu 5 \* |

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| **Twenty Chimneys** | with Professor Muriel Medard | |
| The Button Gmail's Missing: "Compress It" | | Nichole Clarke 09 \* |
| MergeSort: putting everything in its place | | Lee Gavrin 9 \* |
| Rockets! | | Joe Kusters 9 \* |
| The Surreal Numbers | | Kevin Phillips 09 \* |
| How tuning a radio works | | Allan Sadun 09 \* |

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| **Mezzanine Lounge** | with Professor Luís Velásquez-García | |
| CRISPR: How we can edit our DNA | | Arturo Campos0 15 \* |
| Bloom Filters. Easily remember something you have seen before. | | Donald Little 0 9 \* |
| An Inside Look at Counting Cards in Blackjack | | Jeremy Bogle0 15 \* |
| The Pigeonhole Principle, Why Perfect File Compression Is Impossible | | Deanna Heer0 14 \* |
| Preventing Race Conditions in Concurrent Programming | | Matthew Kalinowski 15 > |

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| **Coffeehouse Lounge** | with Alex Chumbley |
| Quantum Superposition: When guessing is good enough | Dencil Wilmot 05 \* |
| What the future sounded like | Alex Souvannakhot 05 \* |
| How to stream Netflix, FaceTime, and go on Facebook all at the same time | Tamar Weseley 05 \* |
| CRISPR/Cas9 | Colin McDonnell 015 \* |
| How to End the World | Gabrielle Rivera 09 \* |

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| **PDR 4** | with Virginia Chiu |
| Through the Galactic Looking Glass: How We Can See 13 Billion Years Into the Past and Why That Matters for the GPS in Your Phone | Lily Zhou 13 \* |
| The Transistor | Daniel Moon 13 \* |
| Real Life Mind Control | Michaela Ennis 13 \* |
| Prisoner's Dilemma: To Tell or Not to Tell | Morgan O’Brien 13 \* |
| Max Flow: The Secret to Plumbing and Warfare | Devin Neal 11 > |

1pm

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| Title | Presenter Notes |

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| **PDR 1 + 2** | with Emily Zhang |
| How to Build a Supercar | Liza Gaylord 14 \* |
| Over and Over Again: Fractals and Their Applications | Akshay Ravikumar 17 \* |
| Who should be in charge? Leader election in a distributed network | Barbara Duckworth 15 \* |
| Counting to Infinity | Weilian Chu 14 \* |
| Designing Randomness in Video Games | Logan Martin 10 \* |
| (no title) | Andre Mroz \* |

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| **Twenty Chimneys** | with Dr. Jason Miller & Nikhil |
| Don't Jump to Conclusions: Good Statistics Can Lead to Bogus Conclusions | Victoria Xia 11 \* |
| Getting Close Enough to the Point | Emmanuel Fasil 012 \* |
| Buck Converters | Andre Walker 10 \* |
| Writing Better Computer Programs, Automatically | Zachary Neely 010 \* |
| Hijacking the Immune System | Maria Karelina 10 \* |

Special thanks to:

Katherine Touafek (School to Careers Partners)

Alison Langsdorf (Weston)  
David Case (Madison Park)

Jennifer Zhang and TechX  
          MIT CAC  
          Emily Zhang (MIT)

my.notes

Dear High School Student,

We hope you enjoyed your visit to MIT! We’d like some feedback to improve the experience for future conference attendees like yourselves. Please answer all of the following questions:

**About You** Please circle the best answer(s):

I am a high school: { freshman sophomore junior senior } I am: { male female }

I’ve taken: { AP math AP chem AP physics AP bio programming }

In general, I found the talks { too hard just right too easy } to understand

In general, I understood { all most some a few none } of them.

I am considering a technical career (in science, engineering, math, technology, etc) { yes no }

**About Your Day**

For each hour, write the name of the room moderator, and the title/presenter of the best talk of that hour.

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| **Timeslot** | **Room** | **Best Presenter in Room during this Timeslot** |
| 9:00 am – 10:00 am |  |  |
| 10:00 am – 11:00 am |  |  |
| 11:00 am – 12:00 pm |  |  |
| 12:00 pm – 1:00 pm  1:00pm – 2:00pm |  |  |

What did you learn or like about it? (You can use the back of this sheet!)

Any feedback you want to relay to any of the presentations you heard? (You can use the back of this sheet!)

Turn in this form for a piece of candy!