EIGHTH ANNUAL PRIMES CONFERENCE 2018

Program for Research In Mathematics, Engineering, and Science for High School Students

Saturday, May 19

8:30 am Welcoming remarks
Prof. Michel Goemans, Head of the MIT Mathematics Department
Prof. Pavel Etingof, PRIMES Chief Research Advisor
Dr. Slava Gerovitch, PRIMES Program Director

9:00 am Session 1: Combinatorics
Nathan Ramesh, Max Guo, Gopal Goel, Andrew Yao, Aayush Karan, Nithin Kavi, and Wendy Wu, On the Okounkov-Olshanski formula for the number of tableaux of skew shapes (mentor Prof. Alejandro Morales, UMass Amherst)

5:00 pm Session 15: PRIMES Circle
Makiah Bennett, Aneesha Manne and Lara Zeng, Connect Spokes: An original game for generating functions in combinatorics (mentor Kevin Ellis)

Sunday, May 20

8:45 am Welcoming remarks
Dr. Slava Gerovitch, PRIMES Program Director
Dr. Tanya Khovanova, PRIMES Head Mentor

9:00 am Session 8: Combinatorics
Vinjai Vale, A new paradigm for computer vision based on compositional representation (mentor Kevin Ellis)
Ben Chen, Richard Chen, Joshua Guo, Shane Lee, Neil Malur, Nastia Polina, Poonam Sahoo, Anuj Sakarda, Nathan Sheffield, and Armaan Tiplimeni (PRIMES STEP Senior students), On base 3/2 and its sequences (mentor Dr. Tanya Khovanova)
Matvey Borodin, Hannah Han, Kaylee Ji, Alexander Peng, David Sun, Isabel Tu, Jason Yang, William Yang, Kevin Zhang, and Kevin Zhao (PRIMES STEP Junior students), Chips Go BOOM BOOM!!! (mentor Dr. Tanya Khovanova)

10:10 am Session 9: Combinatorics
Vincent Bian, Packing anchored rectangles (mentor Dr. Tanya Khovanova)
Eric Zhang, On quasi-regular permutations (mentor Dr. Tanya Khovanova)
Wayne Zhao, Counting Sudoku variants (mentor Dr. Tanya Khovanova)

11:05 am Session 10: Analysis
William Fisher, Polynomial Wolff axioms and Kakeya-type estimates for bent tubes (mentor Robert Burkard)
Alan Yan, Asymptotics of certain geometric dynamics (mentor Prof. Sergiy Merenkov, CCNY – CUNY)

Andy Xu, Approximating the Hurwitz zeta function (mentor Hyun Jung Kim)

12:00 pm Session 11: Algebraic combinatorics
Aurash Vatan, Finding generators of Jacobian groups of finite graphs (mentor Dr. Xiaomeng Xu)
Daniel Zhu, On the Okounkov-Olshanski formula for the number of tableaux of skew shapes (mentor Prof. Alejandro Morales, UMass Amherst)
Allen Wang, Permutations with up-down signatures of nonnegative partial sums (mentor Guangyi Yue)

2:00 pm Welcoming remarks
Prof. Srim Devadas, MIT EECS Department

2:10 pm Session 12: Computer Science
Vivek Bhatpjara, aCOAD: Efficient Apprend-Only Authenticated Dictionary for Transparency Logs (mentor Alin Tomescu)
Theodor Lukin’Yelin, Designing private forums using differential privacy (mentor Albert Kwon)
Sanjit Bhat and David Lu, Var-CN and DynaFlow: Improved attacks and defenses for website fingerprinting (mentor Albert Kwon)
Harshal Shelte and Andrew Sun, Extending distributed-systems tracing vertically into the Linux kernel (mentor Dr. Raja Sambasivan, Boston University)

3:30 pm Session 13: Medical Informatics
Mukhia Bennett, Lexical AI for patient-centered clinical diagnoses (mentor Prof. Gil Alpertowitz)
Andrew Gritsevskiy, Capsule networks for low-data transfer learning (mentors Prof. Gil Alpertovitz and Maxim Karibaylov)
Kevin Hu, Discovery of exon splicing relationships across cancer cell lines (mentor Dr. Mahmoud Ghandi, Broad Institute)

4:25 pm Session 14: Math Reading Groups
Nhat Pham and Annot Sakarda, Concrete mathematics: Exploring summations (mentor Zhulin Li)
Dylan Pentland, The j-invariant of an elliptic curve (mentor Chun Hong Lo)

5:10 pm Session 15: PRIMES Circle
Aneisha Manine and Lara Zeng, Generating functions in combinatorics (mentor Uma Roy)
Irsh Yang and Victoria Zhang, Gaussian integers and their relationship to ordinary integers (mentor Matthew Weiss)
Sam Costa and Elin Gu, Inverse knots and amphicheirality (mentor Joseph Zurier)