Sanha Cheong

CONTACT INFORMATION

Stanford University
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EDUCATION

Stanford University, Stanford, CA

Ph.D. in Physics **September 2017 ~ Present**

- Works on the ATLAS experiment at the SLAC Group
- Interested in particle physics, cosmology, machine learning, artificial intelligence, novel data analysis algorithms, and network theory

University of Rochester, Rochester, NY

B.S. in Physics & Astronomy (Highest Distinction), B.A. in Mathematics **Class of 2017**

- Overall GPA: 3.92/4.00, Major GPA 3.99/4.00, Dean's List for all eligible semesters
- Elected to Phi Beta Kappa (ΦBK)
- International Baccalaureate (IB) Scholarship, 16k per year

Yew Chung International School of Shanghai, Shanghai, China

International Baccalaureate (IB) Diploma **Class of 2013**

- Total of 8 IB subjects, including Further Mathematics and Higher Level Physics

RESEARCH INTERESTS

Particle experiments, phenomenology, cosmology, machine learning, and algorithms
Higgs, QCD and jet physics, dark matter, supersymmetry (SUSY), beyond the Standard Model physics (BSM), CP-violation, early-stage universe, dark energy, large-scale structures, neural networks, artificial intelligence, statistical analysis algorithms, network theory

RESEARCH EXPERIENCES

Stanford University, Stanford, CA

Research Assistant (Adviser: Prof. Ariel Schwartzman) **August 2017 ~ Present**

- Pile-up mitigation studies at the ATLAS experiment, preparing for the HL-LHC
- Machine learning techniques to identify hard-scatter objects vs pile-up objects
- Track-vertex association, 'fake' photon studies, pile-up jet-tagging

University of Rochester, Rochester, NY

Research Assistant (Adviser: Prof. Regina Demina) **November 2015 ~ May 2017**

- Research in Baryon Acoustic Oscillations (BAO) using SDSS-III BOSS data
- Developed a novel algorithm accelerating the calculation of the galaxy '2-point correlation function' with an alternative background subtraction method

Lab Technician (Adviser: Prof. Pierre-Alexandre Gourdain) **June 2015 ~ December 2015**

- Designing and building equipments for high-energy density plasma experiments

OTHER ACADEMIC EXPERIENCES

University of Rochester, Rochester, NY

- Senior thesis in *Theoretical Cosmology, Cosmological Inhomogeneities and Their Backreaction* (Adviser: Prof. Eric G. Blackman), Spring 2017
- Reading course in theoretical physics, *The Kapitsa Society*, August 2016 ~ May 2017
- Independent study in *Representation Theory and Lie Groups/Algebras* (Adviser: Prof. Jonathan Pakianathan), Spring 2015
- Independent study in *Philosophy of Physics* (Adviser: Prof. Hayley Clatterbuck), Fall 2016

Teaching & Advising Experiences

Stanford University, Stanford, CA

Teaching Assistant

Physics Department — **January 2018 ~ Present**

- PHYSICS 41 Mechanics, Winter 2018

University of Rochester, Rochester, NY

Teaching Assistant

Department of Physics & Astronomy — **August 2015 ~ May 2017**

- PHY 227 Thermodynamics & Statistical Mechanics, Spring 2017
- PHY 142 Electricity & Magnetism (Honors), Fall 2016
- PHY 143 Waves and Modern Physics (Honors), Spring 2016
- PHY 122 Electricity & Magnetism, Fall 2015

Department of Mathematics — **August 2014 ~ May 2015**

- MTH 172 Honors Calculus II, Spring 2015
- MTH 171 Honors Calculus I, Fall 2014

Peer Adviser (Physics & Astronomy, Mathematics) — **August 2016 ~ May 2017**

College Center for Advising Services

- Advising & counseling service for younger students about major, research opportunities, connections with professors, independent study, study abroad, etc.

Physics GRE Tutor — **August 2016 ~ May 2017**

Society of Physics Students (SPS), Department of Physics & Astronomy

- Review materials and lecture notes to prepare students for the Physics GRE, review sessions and Q & A hours

Leadership & Representative Positions

University of Rochester, Rochester, NY

Business Manager, *Society of Physics Students (SPS)* — **June 2016 ~ May 2017**

Student Representative, *Physics & Astronomy Undergraduate Curriculum Committee* — **September 2016 ~ May 2017**

Outreach & Service

Stanford University, Stanford, CA

Graduate Mentor, *Stanford Undergraduate Research Association* — **January 2018 ~ Present**

University of Rochester, Rochester, NY

Alumni Interviewer, *Office of Admissions* — **November 2017 ~ Present**

Refereed Journal Publications

[1] R. Demina, **S. Cheong**, S. BenZvi, O. Hindrichs. A Computationally Efficient Approach for Calculating Galaxy Two-Point Correlationstext. Submitted to *Monthly Notices of the Royal Astronomical Society*, under review (arXiv:1611.09892).

Conference Talks/Posters

[1] **S. Cheong**. Modification to the Calculation of a Two-point Correlation Function. *Q2C: Quarks to Cosmos, APS April Meeting 2017*, Washington, DC, January 28-31, 2017.

[2] **S. Cheong**. The First 380,000 Years in 5 Minutes. *PAS Department Summer Research & Internship Symposium*, Rochester, NY, October 1, 2016.

[3] **S. Cheong**. Introduction to Baryon Acoustic Oscillations (BAO). *University of Rochester Summer REU Presentation*, Rochester, NY, August 5, 2016.

AWARDS AND SUCH

[1] Janet Fogg Prize. *University of Rochester*, May 2017.

[2] Excellence in Undergraduate Teaching. *University of Rochester*, May 2017.

PROFESSIONAL MEMBERSHIPS

American Astronomical Society (AAS)
American Physical Society (APS)
Phi Beta Kappa (ΦBK)
Society of Physics Students (SPS)
Sigma Pi Sigma ($\Sigma\Pi\Sigma$)

COMPUTER AND HARDWARE SKILLS

Data Analysis

- Experiences in big data analysis for physics & astronomy research
- Developing new statistical analysis algorithms and applying machine learning techniques

Programming Languages:

- C, C++, CERN ROOT, Python, Java, Mathematica
- UNIX shell scripting (Bash)

Document Editing and Productivity Software:

- TEX (LATEX, BIBTEX)
- GitHub, Microsoft Office, Google Docs
- Basic webdesign using HTML, CSS, Javascript, and Jekyll

Hardware Skills

- Basic machine shop training, circuit design (Protel DXP), printed circuit boards

LANGUAGES

English (fluent), Korean (fluent), Mandarin (conversational)

CITIZENSHIP

Republic of Korea