## Sanha Cheong


CONTACT INFORMATION

**Stanford University**
**Physics Department**
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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 & 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 ($\Phi$B$\kappa$)
Society of Physics Students (SPS)
Sigma Pi Sigma ($\Sigma\Pi\Sigma$)

COMPUTER & 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