Sanha Cheong

CONTACT INFORMATION

Stanford University
Physics Department
Stanford, CA 94305 U. S. A.

Phone: +1 (585) 512-4789
E-mail: sanha@stanford.edu
Web: https://www.slac.stanford.edu/~sanha/

EDUCATION

Stanford University, Stanford, CA

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

- Works on the ATLAS experiment at the SLAC ATLAS 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, dark matter, long-lived particles (LLP), supersymmetry (SUSY), beyond the Standard Model physics (BSM), QCD and jet physics, CP-violation, early-stage universe, dark energy, large-scale structures, neural networks, artificial intelligence, statistical analysis algorithms, network theory

RESEARCH ACTIVITIES

SLAC ATLAS Group, Menlo Park, CA

Graduate Researcher (Adviser: Prof. Ariel Schwartzman) **August 2017 ~ Present**

- Simulation & trigger studies for LLP searches using timing information at the HL-LHC
- ATLAS upgrade hardware: ITk, RD 53 read-out, testing, calibration, etc.
- Machine learning techniques for high-energy physics

University of Rochester, Rochester, NY

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

- Analysis 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

Teaching Experiences

Stanford University, Stanford, CA

Teaching Assistant

- PHYSICS 41 Mechanics, Winter 2018

Teaching Mentor, Physics Department and Vice Provost for Teaching & Learning **June 2018 ~ Present**

University of Rochester, Rochester, NY

Teaching Assistant

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

Physics GRE Tutor, *Society of Physics Students (SPS)* **August 2016 ~ May 2017**

Leadership & Representative Positions

Stanford University, Stanford, CA

Recruitment Chair, *Graduate Students in Applied Physics & Physics (GSAPP)* **June 2018 ~ Present**

First-year Mentoring Chair, *GSAPP* **June 2018 ~ Present**

SASS Czar (Organizer), *SLAC Association for Student Seminars (SASS)* **June 2018 ~ Present**

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**

Advising, Outreach, and Other Services

Stanford University, Stanford, CA

Graduate Coordinator for Summer Undergraduate Research, *Physics Department* **June 2018 ~ Present**

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

University of Rochester, Rochester, NY

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

Peer Adviser (Physics & Astronomy, Mathematics), *College Center for Advising Services* **August 2016 ~ May 2017**

Refereed Journal Publications

[1] R. Demina, **S. Cheong**, S. BenZvi, O. Hindrichs. A Computationally Efficient Approach for Calculating Galaxy Two-Point Correlations. *Monthly Notices of the Royal Astronomical Society*, sty1812. (arXiv:1611.09892)

Oral & Poster Presentations on Research

[1] **S. Cheong**. Introduction to Deep Learning for Mathematicians by a Physicist (Capabilities of Neural Networks: Mathematical and Empirical Perspectives). *Department of Mathematics Graduate Seminars*, Sogang University, Seoul, South Korea, July 16, 2018.

[2] **S. Cheong**, J. Pearkes, A. Cukierman. Merged Di-photon Identification for the ATLAS Experiment at the Large Hadron Collider. *CS 231N Project Poster Session, Spring 2018*, Stanford, CA, June 12, 2018.

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

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

SCHOOLS AND WORKSHOPS ATTENDED

[1] *46th SLAC Summer Institute (The Standard Model at 50: Successes & Challenges)*, Menlo Park, CA, July 30 - August 10, 2018

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 (ΦBK)
Society of Physics Students (SPS)
Sigma Pi Sigma (ΣΠΣ)

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:

- PYTHON, C, C++, ROOT, JAVA, MATHEMATICA
- UNIX shell (Bash) scripting

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