Clare Singer
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August 2019
1200 E. California Blvd., MC C1-221
Pasadena, CA 91125

Education

- **California Institute of Technology (Caltech)** — Pasadena, CA
  Department of Environmental Science and Engineering — *October 2018 - Present*
  - Advisors: Dr. Tapio Schneider & Dr. John Seinfeld
  - M.S. expected June 2020; Ph.D. expected June 2024
- **University of Chicago** — Chicago, IL
  BA Physics, BS Mathematics (GPA 3.957/4.0) — *September 2014 - June 2018*

Awards and Fellowships

NSF Graduate Research Fellowship 2018-2021
John Haeseler Lewis Prize (top graduating physics major) 2018
Barry M. Goldwater Scholarship ($7,500 towards tuition) 2017
David W. Grainger Fellowship (top rising senior in physics, full tuition) 2017
Astronaut Scholarship ($10,000 towards tuition) 2017
College Summer Research Fellowship 2017
Jeff Metcalf Fellowship, UChicago Institute for Molecular Engineering 2016
University Scholar Award, UChicago 2014
Dr. Vaccaro Scholarship for outstanding research project 2014

Research Experience

- **Caltech, Department of Environmental Science & Engineering** — Pasadena, CA
  Advisors: Dr. Tapio Schneider and Dr. John Seinfeld — *October 2018 - Present*
  - Computational modeling, including large-eddy simulations and more theoretical mixed-layer models, of marine boundary layer stratocumulus clouds. I am interested in aerosol-cloud interactions, in particular the effects of aerosol hygroscopicity on cloud dynamics. I also am working on a project about the 3D radiative effects of shallow and deep cumulus clouds.
- **University of Chicago, Department of the Geophysical Sciences** — Chicago, IL
  Dr. Liz Moyer's Lab — *January 2017 - Present*
  - Helped test, calibrate, and operate the Chicago Water Isotope Spectrometer (Chi-WIS) that flew in the StratoClim campaign in July/August 2017 over the Asian monsoon. Processed and analyzed data from the StratoClim campaign. Conducted comparisons between water measurements made in-situ and remote-sensing satellite measurements. Currently writing an instrument intercomparison paper from the campaign measurements.
- **Ben-Gurion University, Zuckerberg Institute for Water Research** — Sde Boker, Israel
  Dr. Chris Arnusch's and Dr. Roy Bernstein's Labs — *Summer 2016*
  - Created modified membranes for wastewater treatment using a novel ink-jet printing approach. Used ATR-FTIR, Contact Angle, XPS, AFM, SEM, and Zeta Potential measurements for characterization.
- **University of Chicago, Department of Physics** — Chicago, IL
  Dr. Heinrich Jaeger's Lab - James Franck Institute — *January 2015 - June 2016*
  - Explored the effect of microscopic shape of granules on the macroscopic properties of dry granular structures. Studied jamming in dry granular packings under impact. Collaborated with architects to create large-scale granular structures that were displayed in the 2015 Chicago Architecture Biennial.
- **Georgetown University, Department of Physics** — Washington, D.C.
  Dr. Daniel Blair's Lab - Institute for Soft Matter — *Summer 2013, Summer 2015*
  - Studied colloidal rods at the oil-water interface with confocal microscopy and pendant-drop tensiometry.
  - Researched pH dependence of the viscosity of silk protein solutions for use in biomedical applications. Used viscometry and dynamic light scattering techniques to determine the effect of pH on the proteins.

Publications and Presentations

1. **Singer, C.E.**, Hui, K. L., Schneider, T., *A Conceptual Model of the Climate Change Response in Stratocumulus-Topped Boundary Layers*, presented at 2019 AMS Conference on Atmospheric and Oceanic Fluid Dynamics; Portland, ME; 24-28 June 2019.

2. **Singer, C.E.**, Clouser, B., Sarkozy, L., Gaeta, D.C., Moyer, E.J., *ChiWIS: The Chicago Water Isotope Spectrometer*, presented at Goldschmidt 2018; Boston, MA; 13-17 Aug 2018.

3. **Singer, C.E.**, Clouser, B., Gaeta, D.C., Moyer, E.J., *Comparison of water vapor from observations and models in the Asian Monsoon UTLS region*, Abstract A21I-2258, presented at 2017 AGU Fall Meeting; New Orleans, LA; 11-15 Dec 2017.

4. Bernstein, R., **Singer, C.E.**, Singh, S.P., Mao, C., Arnusch, C.J., *UV initiated surface grafting on polyethersulfone ultrafiltration membranes via ink-jet printing assisted modification.* J. Memb. Sci. **548** (2018).

5. **Singer, C.E.**, Bernstein R., Arnusch, C.J., *Ink-jet printing assisted modification of ultra-filtration membranes for wastewater treatment*, presented at the Naval Academy Science and Engineering Conference (NASEC) on environmental sustainability; Annapolis, MD; 13-15 Nov 2016.

6. Murphy, K.A., Reiser, N., Chosky, D., **Singer, C.E.**, Jaeger, H.M., *Freestanding loadbearing structures with Z-shaped particles.* Granular Matter 18, 26 (2016).

7. **Singer, C.E.**, Blair, D.L., *Colloidal rods at the oil-water interface*, presented at 11th Mid-Atlantic Soft Matter Conference; University of Delaware; 11 Jul 2013.

Honors

Chair's Award for Distinguished Service in Physics 2018
Phi Beta Kappa (top 2% by GPA) 2017
Udall Scholarship Nominee, UChicago 2016
Dean's List, UChicago 2015-2018
3rd place physics, Montgomery Area Science Fair 2014
Intel Science Talent Search Research Report Badge 2014
1st place physics, Washington Academy of Sciences 2014
National Merit Finalist 2013
National AP Scholar 2013
ExploraVision Competition Honorable Mention 2013

Work Experience

- **Senior Interviewer** — Chicago, IL
  University of Chicago, Office of College Admissions — *June 2017 - May 2018*
  - Interviewed applicants for undergraduate admissions to the college. Occasionally lead campus tours, answered office phone calls, and worked other student jobs in the office.

- **Summer Head Counselor and Fall Outdoor Education Facilitator** — Poolesville, MD
  Calleva Outdoor Adventures — *Summer 2014*
  - Facilitated multi-day outdoor education trips for schools that promoted engagement with the outdoors and built self-confidence. Led rock climbing and white water rafting trips.

- **Tutor** — Chicago, IL
  Math, Physics, and Computer Science — *2013 - 2015*
  - Tutored 7th-12th grade students in Algebra, Trigonometry, AP Physics C, and JAVA programming

Leadership Activities

- **Caltech Title IX Student Leadership Team** Pasadena, CA
  Giving Voice script writer (2019-2020); Title IX Council member (2019-2020) *2019 - Present*
  - Giving Voice is an initiative at Caltech to create awareness around Title IX issues and provide resources for students, staff, and faculty. We create short videos that illustrate examples of issues that may occur particularly in STEM classrooms or workplaces. The Council is a student advisory group to the Title IX Office that works with the staff to educate and assist members of the Caltech community with Title IX related issues.
- **Caltech Jewish Student Association** Pasadena, CA
  Co-founder & Treasurer (2019-2020) *2019 - Present*
  - Manages all administrative and financial dealings of the club. Organizes and hosts events. Aimed to create a more inclusive campus with a diversity of options for Jewish students to express themselves.
- **Caltech Women in GPS** Pasadena, CA
  Vice President (2019-2020) *2019 - Present*
  - Assists club president in managing activities – including journal club discussions, workshops, and social events – communicating with faculty, and recruiting new members.
- **University of Chicago Society of Women in Physics (SWiP)** Chicago, IL
  President (2017-2018), Vice President (2016-2017), Board Member (2016) *2014 - 2018*
  - Organized and coordinated logistics for events to foster a strong community among students in the physics department. Coordinated SWiP's mentorship program for first year students. Worked with professors and administrative staff to improve communication between undergraduates and faculty. Attended the Conference of Undergraduate Women in Physics (CUWiP) in January 2015 at the University of Michigan and January 2018 at the University of Iowa.
- **University of Chicago Taekwondo Club** Chicago, IL
  Vice President (2016 - 2018), President (2015 - 2016), Instructor *2014 - 2018*
  - Coordinated practice schedules and logistics with the Athletics Department. Oversaw club finances. Advertised around campus to recruit new members and managed social media and club communication
- **University of Chicago Hillel** Chicago, IL
  Board Member At-Large *2014 - 2018*
  - Planed and organized events for the Jewish community on campus. Created a "Black-Tie Shabbat" event and organized it for all four years.
- **University of Chicago FEMMES: Curriculum developer** Chicago, IL
  Females Excelling More in Math Engineering and the Sciences *2016*
  - Wrote computer science curriculum for code camp and weekly workshops for local middle school girls.

Technical Skills

- **Foreign Languages:** French (beginner), Japanese (beginner).
- **Programming Languages:** Python, IDL, LaTeX(advanced); Julia, MatLab (intermediate); C++, Java, Mathematica (beginner).
- **Software Knowledge:** Microsoft Office, Autodesk Inventor, ImageJ, Adobe Illustrator and Photoshop.