



# David Rower

ASPIRING PHYSICIST · COMPUTATIONAL SCIENTIST

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## Education

### College of Creative Studies, University of California, Santa Barbara

Santa Barbara, CA

PHYSICS B.S. (IN PROGRESS), MATHEMATICS MINOR (COMPLETED)

Sep. 2015 - Jun. 2019

- GPA: 4.0
- Coursework: Quantum Mechanics, Statistical Mechanics, Numerical Analysis, Waves and Kinetic Theory, Network Theory, Classical Mechanics, Intro to General Relativity, Intro to Real Analysis, Linear Algebra, Differential Equations

## Academic Research

### Atzberger Research Group

Santa Barbara, CA

DEPARTMENT OF MATHEMATICS/DEPARTMENT OF MECHANICAL ENGINEERING, UCSB

Jan. 2016 - Current

- Implemented single-bead fluid membrane model in C++ for LAMMPS molecular dynamics engine.
- Studied phase-separation of heterogeneous vesicles with species of different preferred curvatures via graph theoretic clustering methods.
- Created numerical bending rigidity estimator for arbitrary star-shaped vesicles utilizing equilibrium fluctuation spectra.
- Conducted active numerical experiments to probe mechanical responses to compression and passage through narrow channels.
- Work presented in several conferences via posters and talks.

### Pedarsani Research Group

Santa Barbara, CA

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING, UCSB

Sep. 2017 - Dec. 2017

- Spearheaded utilization of microscopic traffic simulators for testing and validation of autonomous vehicle traffic models.
- Developed numerical validations of models using the SUMO framework.
- Delivered technical write-up to group for future reference.

## Industry Work/Research

### Toyon Research Corporation

Santa Barbara, CA

AUTONOMOUS SYSTEMS INTERN

Jan. 2018 - Current

- Developed end-to-end simulation and tracking framework to prototype bearings-only tracking algorithms in Matlab.
- Developed continuous integration scripts for automatic generation of documentation repositories.
- Developed logging class for data fusion C++ application, and accompanying analysis scripts in Python.

### OpenEye Scientific Software

Santa Fe, NM

OPTIMIZATION INTERN

Jun. 2017 - Sep. 2017

- Developed and tested Hessian-based filters for shape comparison of small molecules.
- Developed and tested convergence criteria for overlap optimization algorithms.
- Tested and debugged rotation representations.

### UCSB Enterprise Technology Services

Santa Barbara, CA

STUDENT DEVELOPER

Mar. 2017 - Sep. 2017

- Implemented a Remotely Triggered Black Hole (RTBH) system via ExaBGP and the Flask framework to replace legacy system.
- Designed a RESTful API to communicate with the RTBH server.
- Developed real-time database logging system on Raspberry Pi to replace legacy system.

## Presentations

### EQUILIBRIUM SHAPE FLUCTUATIONS OF HETEROGENEOUS BIOLOGICAL MEMBRANES

Aug. 2018 **Minisymposium Speaker**, Society for Ind. and Appl. Mathematicians Conf. on the Life Sciences (SIAM LS 18)

Minneapolis, MN

Jun. 2018 **Speaker**, UCSB Research Internships in Science and Engineering Awards Ceremony

Santa Barbara, CA

### CURVATURE-DRIVEN PHASE-SEPARATION ON SPHERICAL VESICLES: INSIGHTS FROM A SINGLE-BEAD MODEL

Apr. 2018 **Poster Presenter**, Southern California Applied Mathematics Symposium (SOCAMS 2018)

Santa Barbara, CA

Mar. 2018 **Poster Presenter**, American Physical Society March Meeting (APS March 2018)

Los Angeles, CA

## CAN HESSIANS IMPROVE ROCS?

Sep. 2017 **Speaker**, OpenEye Scientific Software Summer Internship Concluding Ceremony

*Santa Fe, NM*

## SELF-ASSEMBLED LIPID BILAYER MEMBRANES: EXPLORING A SINGLE-BEAD MODEL

May 2017 **Poster Presenter**, UCSB Undergraduate Research Colloquium

*Santa Barbara, CA*

## Skills

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**Programming** Python, C++, Matlab, Bash, LaTeX

**Software/OS** Git, Apache Subversion, ParaView, LAMMPS, Ubuntu

**Languages** English

## Honors & Awards

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2018 **Recipient**, UCSB Research Internships in Science and Engineering (RISE) Grant

2018 **Recipient**, American Physical Society Future of Physics Days (APS FPD) Travel Grant