

Alexander Berne

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RESEARCH INTERESTS

Numerical modelling of planetary interior processes, including tidal dynamics, fault deformation, and thermal evolution. Space geodesy and associated applications, particularly using SAR and gravitmetry. Bayesian methods for large geophysical inverse problems.

EDUCATION

2020 - 2025 PhD (Geophysics) at **California Institute of Technology** (GPA: 4.0/4.0)
2019 - 2020 Master's Degree (M.Sc.) at **Oxford University** (Distinction)
2015 - 2019 Bachelor's Degree in Mechanical Engineering at **University of Miami** (GPA: 4.0/4.0)

RELEVANT PUBLICATIONS

- Berne, Alexander et al. (2023a). "Inferring the Mean Thickness of the Outer Ice Shell of Enceladus from Diurnal Crustal Deformation". In: *Journal of Geophysical Research E: Planets* 128.6. URL: <https://doi.org/10.1029/2022JE007712>.
- (2023b). "Using Tidally-Driven Elastic Strains to Infer Regional Variations in Crustal Thickness at Enceladus". In: *Geophysical Research Letters* 50.22. URL: <https://doi.org/10.1029/2023GL106656>.
- (2024). "Jet activity at Enceladus linked to tidally-driven strike-slip motion along tiger Stripes". In: *Nature Geoscience (accepted for publication)*.
- Park, Ryan et al. (2024). "The Global Shape, Gravity Field, and Libration of Enceladus". In: *Journal of Geophysical Research E: Planets* 129.1 (Fourth Author). URL: <https://doi.org/10.1029/2023JE008054>.
- Rovira-Navarro, Marc et al. (2024). "A Spectral Method to Compute the Tides of Laterally Heterogeneous Bodies". In: *Planetary Science Journal (accepted for publication)* (Third Author).

RELEVANT WORK EXPERIENCE

Affiliate at NASA Jet Propulsion Laboratory April 2022 - present
Developed a new finite element code (SatDef) to simulate deformation on orbiting satellites. SatDef was developed under a Strategic Research and Development Initiative (SRTD) for internal use at JPL.

HONORS AND AWARDS

NASA FINESST (2022 - 2025) "Exploring Different Scales of Crustal Deformation at Enceladus"
Phillip and Patricia Frost Scholarship (2019-2020)
Saludatorian, President's Honor Roll, and President's Scholarship at University of Miami (2015-2019)
High School National Merit Scholar (2014)

OUTREACH

EQ Fellows Program (Summer mentoring of High School Students interested in Geosciences; 2022-2023)
Pasadena PAL program (Weekly tutoring students at Pasadena Jefferson middle school)