BENJAMIN IDINI

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RESEARCH INTERESTS

Solar System Exploration · Planetary Interiors and Evolution · Ocean Worlds · Tidal Interactions · Extraterrestrial Seismology· Planet Formation · Gravity Radio Science · Earthquake Mechanics · Earthquake Ground Motion · Tectonic Deformation

EDUCATION

PhD in Planetary Science, Caltech 2022
"Earthquakes and the new paradigm of diluted cores in gas giant planets" (Advisor: David Stevenson)
MS in Geophysics, Caltech 2019
MS in Earthquake Engineering, Universidad de Chile 2016
"Curvas de atenuación para terremotos intraplaca e interplaca en la zona de subducción chilena" (Advisors: Fabián Rojas and Sergio Ruiz)
BS in Structural Engineering, Universidad de Chile 2013

ACADEMIC APPOINTMENTS

UC President's Postdoctoral Fellow, UC Santa Cruz, CA September 2022 — August 2024
Graduate R/T Assistant, Caltech, Pasadena, CA June 2017 — August 2022
Research Geophysicist, Universidad de Chile, Santiago, Chile March 2016 — June 2017

REFEREED PUBLICATIONS

14. Tulekeyev, A., et al., including **Idini, B.** (2024). Constraints on the long-term existence of dilute cores in giant planets. [10.48550/arXiv.2405.06790]
13. Flores-Cuba, J., et al., including **Idini, B.** (2024). Mechanisms and seismological signatures of rupture complexity induced by fault damage zones in fully-dynamic earthquake cycle models. [10.1029/2024GL108792]
12. Idini, B. & Nimmo, F. (2024). Resonant stratification in Titan's global ocean. The Planetary Science Journal. [10.3847/PSJ/ad11ef]
11. Idini, B., et al. (2024). Double distance dependence in high–frequency ground motion along the plate boundary in Northern Chile. Journal of South American Earth Sciences, 133. [10.1016/j.jsames.2023.104699]
10. Howard, S., et al., including **Idini, B.** (2023). Jupiter's interior from Juno: Equation-of-state uncertainties and dilute core extent. Astronomy and Astrophysics, 672. [10.1051/0004-6361/202245625]
9. Idini, B. & Stevenson D.J. (2022). The gravitational imprint of an interior–orbital resonance in Jupiter–Io. The Planetary Science Journal, 3(4), 89. [10.3847/PSJ/ac6179]
8. Idini, B. & Stevenson D.J. (2022). The lost meaning of Jupiter's high–degree Love numbers. The Planetary Science Journal, 3(1), 11. [10.3847/PSJ/ac4248]
7. Idini, B. & Stevenson D.J. (2021). Dynamical tides in Jupiter as revealed by Juno. The Planetary Science Journal, 2(2), 69. [10.3847/PSJ/abe715]

6. Idini, B. & Ampuero J-.P. (2020). Fault-zone damage promotes pulse-like rupture and back-propagating fronts via quasi-static effects. Geophysical Research Letters, 47(23), e2020GL090736. [10.1029/2020GL090736]
5. Erickson, B., et al., including **Idini, B.** (2020). The community code verification exercise for simulating sequences of earthquakes and aseismic slip (SEAS). Seismological Research Letters, 91(2A), 874-890. [10.1785/0220190248]
4. Ross, Z., **Idini, B.**, et al. (2019). Hierarchical interlocked orthogonal faulting in the 2019 Ridgecrest earthquake sequence. Science, 366, 6463. [10.1126/science.aaz0109]
3. Gurnis, M., et al., including **Idini, B.** (2019). Incipient subduction at the contact with stretched continental crust: The Puysegur Trench. Earth and Planetary Science Letters, 520, 212-219. [10.1016/j.epsl.2019.05.044]
2. Leyton, F., et al., including **Idini, B.** (2018). Empirical site classification of CSN network using strong-motion records. Seismological Research Letters, 89(2A), 512-518. [10.1785/0220170167]
1. Idini, B., et al. (2017). Ground motion prediction equations for the Chilean subduction zone, Bulletin of Earthquake Engineering, 15, 5. [10.1007/s10518-016-0050-1]

Invited Seminars and Colloquia

UC Santa Cruz, Astronomy and Astrophysics Colloquium	May 15, 2024
Stanford University, Geophysics Seminar	May 9, 2024
UC Merced, Physics Colloquium	February 9, 2024
UC Berkeley, Earth and Planetary Science Department Seminar	January 18, 2024
MIT, Earth, Atmospheric, and Planetary Science Department Lecture Series	May 17, 2023
UC Santa Cruz, Geophysical and Astrophysical Fluid Dynamics Seminar	May 12, 2023
UC Davis, Earth and Planetary Science Department Seminar	April 19, 2023
UC Santa Cruz, Earth and Planetary Science Department Whole Earth Seminar	April 18, 2023
UC San Diego & San Diego State University, Astrophysics Seminar	March 1, 2023
UC San Diego, Scripps Institution of Oceanography, IGPP Seminar	February 28, 2023
UC Berkeley, Center for Integrative Planetary Science Seminar	February 1, 2023
Rice University, EEPS Department Colloquium	January 19, 2023
UCLA, Earth, Planetary, and Space Sciences Department Colloquium	October 11, 2022
UC Santa Cruz, Astronomy and Astrophysics Planetary Lunch Seminar	November 7, 2022
Universidad de Chile, Department of Geophysics Seminar (virtual)	June 17, 2022
Caltech, DIX Planetary Science Seminar	April 27, 2021
Caltech, DIX Planetary Science Seminar	June 2, 2020

Software Publications

2. Idini, B (2023). Interiorize: Simple Models of Planetary Tides (github.com/bidini/interiorize).
1. Luo, Y., Ampuero, J.P., et al., including **Idini, B.** (2017). QDYN: a Quasi-DYNamic earthquake simulator (v1. 1). Zenodo.(doi: 10.5281/zenodo. 322459).

Conference Presentations (O: Oral, P: Poster)

13. Resonant stratification in Titan's global ocean and other large ocean worlds, AGU Fall Meeting, San Francisco, 2023 (O).

12. Resonant stratification in Titan and other icy satellites with global oceans, DPS-EPSC Annual Meeting, San Antonio TX, 2023 (O).
11. Future investigations of ocean dynamics in ocean worlds using orbiting spacecraft, Bay Area Planetary Science Conference, Santa Cruz CA, 2023 (O).
10. A tale of two planets: dilute cores in Jupiter and Saturn from in-situ spacecraft observations, UC Santa Cruz Postdocs Association Symposium, Santa Cruz CA, 2023 (O).
9. A tale of two planets: dilute cores in Jupiter and Saturn from in-situ spacecraft observations, UC PPFP Annual Meeting, Lake Arrowhead CA, 2023 (O).
8. The gravitational imprint of dynamical tides in Jupiter (invited), AGU Fall Meeting, Chicago IL, 2022 (O).
7. Tidal constraints on the radial extension and static stability of Jupiter's dilute core, AGU Fall Meeting, New Orleans LA, 2021 (P).
6. Dynamical tides in the Jovian System as revealed by Juno, AGU Fall Meeting, remote, 2020 (P).
5. The first three days of the 2019 Ridgecrest earthquake sequence, SCEC Annual meeting, Palm Springs CA, 2019 (P).
4. A Bayesian Image of the 2017 Kermanshah Seismic Sequence in the Northwestern Zagros, AGU Fall Meeting, Washington DC, 2018 (O).
3. Rupture Complexity Promoted by Damaged Fault Zones in Earthquake Cycle Models. In AGU Fall Meeting, New Orleans LA, 2017 (P).
2. Empirical dynamic amplification factors for sites based on seismic noise, 16th World Conference on Earthquake Engineering, Santiago, Chile, 2017 (O).
1. Ground motion prediction equations for the Chilean subduction zone, 2nd Geophysical Signatures of Earthquakes and Volcanoes - 2GSEV, Santiago, Chile, 2016 (P).

Students Supervised

Dallin Nelson, Southern Utah University undergraduate	2024 — Present
Deep learning applications on Europa's terrain	
Tyler Yuen, San Jose State University undergraduate	2024 — Present
Tidal modeling of Europa's ocean	
Richard Truong, San Francisco State University undergraduate	2023 — Present
Planet engulfment and stellar structure	
Rafael Cottom, UC Santa Cruz undergraduate	2024 — Present
Thermal modeling of Europa	
Diego González, University of Chile undergraduate	2016 — 2017
Ground motion spectra of earthquakes in Chile	

Mentorship, Leadership, and Outreach

Guest at the *Universo curioso de la NASA* podcast, NASA en español	2024
Speaker in *La Noche de las Estrellas* outreach event, San Francisco State University	2024
Mentor in Europa Clipper ICONS undergraduate research program, NASA	2024
Booth panelist at Europa Clipper's educational event for high school students, Puerto Rico	2023
Guide in *La Noche de las Estrellas* outreach event, Lick Observatory	2023
Mentor in *Lamat* undegraduate research program, UC Santa Cruz	2023 — Present

Mentor in the Eugene Cota-Robles Fellowship program, UC Santa Cruz 2022 — Present
Invited speaker at NASA's Hyperwall Exhibition, AGU Fall Meeting, Chicago IL 2022
Primary convener and session organizer at AGU Fall Meeting, session: Giant Planet Interiors 2022 — Present
Invited speaker at Science Journeys, Caltech (youtube.com/user/caltech) 2021 — 2022
Mentor in the EPS/ESCI Undergraduate program, UC Santa Cruz 2022
Invited speaker in Urban Math Collaborative program, Long Beach Unified School District 2021
Host in Caltech's *Astronomía en el Bar* (Astronomy on tap hosted in Spanish; youtube.com/c/CaltechAstro) 2021
Mentor in Caltech's International Graduate Student Buddy Program 2020 — 2021
Judge in Caltech's Summer Undergraduate Research Fellow (SURF) poster competition 2020 — 2021
Panelist at Science for March Seismological Laboratory booth, Caltech 2018
Director in Student Federation Board, Universidad de Chile 2014
Director in Engineering Student Council Board, Universidad de Chile 2013

Grants, Honors, and Awards

NASA's Europa Clipper ICONS undergraduate research mentor ($15,017 USD) 2024
NASA's Juno mission, Interior Working Group cochair ($65,815 USD) 2024
Travel award, EPSC-DPS joint meeting ($2,000 USD) 2023
Travel award, USRA-LPI Uranus Flagship Workshop ($2,500 USD) 2023
Travel award, NASA Outer Planets Assessment Group ($1,000 USD) 2022
UC President's Postdoctoral Fellowship ($552,760 USD) 2022
AGU Outstanding Student Presentation Award ($500 USD) 2021
Division of Geological and Planetary Sciences Fellowship, Caltech ($70,000 USD) 2017
Highest Distinction Major Graduate, Universidad de Chile 2016
CONICYT Master of Science Fellowship, Ministry of Education, Chile ($17,000 USD) 2014
Bicentenario Scholarship, Ministry of Education, Chile ($10,000 USD) 2012

Teaching Experience

Teaching Assistant
Planetary Physics, Caltech 2022
Planetary Structure and Evolution, Caltech 2021
Geodynamics, Caltech 2020
Freshman Seminar: Earthquakes, Caltech 2019
Advanced Structural Dynamics, Universidad de Chile 2015
Seismic Design of Structures, Universidad de Chile 2015

Planetary Exploration

Europa Clipper Mission, Science Team Affiliate April 2023 — Present
NASA United States
Juno Mission, Science Team Member and IWG Cochairman January 2020 — Present
NASA United States
KISS Study: Determining the Interior Structure of Uranus September 11-15, 2023

Keck Institute for Space Studies — Pasadena, CA
Planetary Science Summer School — May 2022 — Aug 2022
NASA – Jet Propulsion Laboratory — Remote, United States
Magnus G. Langseth Transoceanic Research Vessel, Science Crew — March 2018
Lamont-Doherty Earth Observatory — Puysegur Trench, Pacific Ocean

Professional Organizations

American Astronomical Society (AAS) — 2023 — Present
Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) — 2021 — Present
Affiliate to the Keck Institute for Space Studies (KISS) — 2019 — Present
American Geophysical Union (AGU) — 2017 — Present

Appearances in Press and Media

Resonant Stratification In Titan's Global Ocean, Keith Cowing, Astrobiology — December 11, 2023
Image of 'violent' earthly phenomenon captured on Jupiter, Ariana Bindman, SFGATE — June 20, 2023
Viaje al Centro de Júpiter, Science Journeys, Caltech — November 4, 2022
A Journey to Jupiter's Core, Science Journeys, Caltech — May 20, 2022
Ciencia con el Telescopio James Webb de la NASA, Astronomía en el Bar — November 17, 2021
Enanas Marrones y Mini Agujeros Negros, Astronomía en el Bar — May 11, 2021
The tides of Jupiter can help scientists understand the history of the Solar System, Passant Rabie, Inverse Magazine — May 5, 2021
Raising Tides on Jupiter with Its Moons, Susanna Kohler, AAS Nova — April 21, 2021
Lessons from Ridgecrest, Robert Perkins, AAAS EurekAlert! — October 17, 2019
Unprecedented movement detected on California earthquake fault capable of 8.0 temblor, Rong-Gong Lin II, LA Times — October 17, 2019
Se detecta movimiento sin precedentes en una falla sísmica en California capaz de producir un temblor de 8.0, Rong-Gong Lin II, The San Diego Union-Tribune En Español — October 17, 2019