

**Krittanon "Pond" Sirorattanakul**  
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## EDUCATION

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<b>Ph.D. in Geophysics</b> , California Institute of Technology, CA, USA with subject minor in <b>Computer Science and Engineering</b> Thesis: <i>Response of faults to transient stresses, in nature and laboratory</i>	2024 (expected)
<b>M.S. in Geophysics</b> , California Institute of Technology, CA, USA	2020
<b>B.S. in Physics</b> (highest honors), Lehigh University, PA, USA	2018
<b>B.A. in Earth &amp; Environmental Sciences</b> (highest honors), Lehigh University, PA, USA	2018

## PROFESSIONAL APPOINTMENTS

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<b>Graduate Research Assistant</b> Seismological Laboratory, California Institute of Technology, Pasadena, CA, USA Advisors: <i>Jean-Philippe Avouac, Ares J. Rosakis</i>	2018-
<b>Petroleum Engineer PhD Intern</b> Geomechanics Chapter, Chevron Technical Center, Houston, TX, USA Mentors: <i>Yunhui Tan, Zijun Fang</i> Supervisor: <i>Peggy Rijken</i>	2022 (3 months)
<b>Visiting Student</b> Earth Observatory of Singapore, Nanyang Technological University, Singapore Mentor: <i>Shengji Wei</i>	2018 (2 weeks)
<b>NASA-funded Education Research Intern</b> Nurture Nature Center, Easton, PA, USA Supervisor: <i>Kathryn Semmens</i>	2017 (6 months)
<b>Lee Teng Undergraduate Intern in Accelerator Science and Engineering</b> Fermi National Accelerator Laboratory, U.S. Department of Energy, IL, USA Mentor: <i>Elvin Harms</i>	2016 (3 months)
<b>Undergraduate Research Assistant</b> Lehigh University, Bethlehem, PA, USA Advisors: <i>Anne Meltzer, Joshua Pepper, Daniel Ou-Yang</i>	2015-18 (4 years)
<b>High School Research Fellow</b> Junior Student Talent Project (JSTP), Thailand Advisor: <i>Sujint Wangsuya</i> (Mahidol University)	2011-13 (2 years)

## FELLOWSHIPS AND GRANTS

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Caltech Graduate Fellowship	2018-19
Royal Thai Scholarship for Undergraduate Studies	2013-18
Grant for Experiential Learning in Health, Lehigh University	2017
College of Arts and Sciences Undergraduate Research Grant, Lehigh University	2015-16
Junior Science Talent Project (JSTP), Thai National Sci. and Tech. Development Agency	2011-13
Young Scientist Competition (YSC), Thai National Sci. and Tech. Development Agency	2011-12

## HONORS AND AWARDS

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Chevron Corporation	
Human Energy Award, for creating measurable value	2022
Space Generation Advisory Council (SGAC)	
Member of the Year, Space Tech. for Earth Applications (STEA) Project Group	2020
The Mars Society	
Finalist with SGAC team, Mars City State Design Competition	2020
The Mars Generation	
24 Under 24 Leaders and Innovators in STEAM and Space award	2018
Lehigh University	
Donnel Foster Hewett Award, Dept. Earth & Env. Sci.	2018
Best Talk, Earth & Env. Sci. Undergraduate Research Symposium	2018
Malcolm J. Gordon, Jr. Physics Prize, Dept. of Physics	2016
Dean's list, every semester	2014-18
International Olympiad on Astronomy and Astrophysics (IOAA)	
Bronze medal, 5 <sup>th</sup> IOAA, Chorzów, Poland	2011
Bronze medal and the Best Team, 4 <sup>th</sup> IOAA, Beijing, China	2010
Asia Pacific Conference of Young Scientists (APCYS)	
Gold medal in Physics, 1 <sup>st</sup> APCYS, Palangka Raya, Indonesia	2012
Singapore International Mathematics Challenge (SIMC)	
Commendation award, 2012 SIMC, NUS High School, Singapore	2012
The Institute for the Promotion of Teaching Science and Technology (IPST), Thailand	
Quarterfinalist team, Wittaya Subphayuth, National Science TV Game Show	2012
Ministry of Social Development and Human Security, Thailand	
Honorary plaque, National Outstanding Youth	2011
Thailand Astronomy Olympiad (TAO)	
Gold medal and Best in Practical, 8 <sup>th</sup> TAO, Bangkok Thailand	2011
Silver medal, 7 <sup>th</sup> TAO, Bangkok, Thailand	2010
Silver medal, 6 <sup>th</sup> TAO, Ubon Ratchatani, Thailand	2009
Thailand Physics Olympiad (TPhO)	
Silver medal, 10 <sup>th</sup> TPhO, Bangkok, Thailand	2011

## PEER-REVIEWED PUBLICATIONS (n=3)

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- [3] **Sirorattanakul, K.**, Ross, Z. E., Khoshmanesh, M., Cochran, E. S., Acosta, M. A. and Avouac, J.-P. (2022), The 2020 Westmorland, California earthquake swarm as aftershocks of a slow slip event sustained by fluid flow, *Journal of Geophysical Research: Solid Earth*, 127(11), e2022JB024693, [doi:10.1029/2022JB024693](https://doi.org/10.1029/2022JB024693).
- [2] Hough, S. E., Thompson, E., Parker, G. A., Graves, R. W., Hudnut, K. W., Patton, J., Dawson, T., Ladinsky, T., Oskin, M., **Sirorattanakul, K.**, Blake, K., Baltay, A. and Cochran, E. (2020), Near-field ground motions from the July 2019 Ridgecrest, California, earthquake sequence, *Seismological Research Letters*, 91(3), 1542-1555, [doi:10.1785/0220190270](https://doi.org/10.1785/0220190270).
- [1] **Sirorattanakul, K.**, Engle, S., Pepper, J., Wells, M., Laney, C. D., Rodriguez, J. E. and Stassun, K. G. (2017), Period Variations for the Cepheid VZ Cyg, *The Astronomical Journal*, 154(6), [doi: 10.3847/1538-3881/aa8ccc](https://doi.org/10.3847/1538-3881/aa8ccc).

## BOOK CHAPTER, THESIS, AND TECHNICAL REPORTS

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- [4] **Sirorattanakul, K.** et al. (2021), Perceptions of space-related non-governmental organizations in disaster risk management revealed from a questionnaire-based study, *Space Generation Advisory Council project report*, 1-18.
- [3] Abdeljelil, N. et al. (incl. **Sirorattanakul, K.**) (2020), The Design of City States on Mars, a Vision from SGAC, In Crossman, F. (Eds.), *Mars City States –New Societies for a New World* (pp. 431-462), Lakewood, Colorado: Polaris Books.
- [2] **Sirorattanakul, K.** (2018), Characterization of slip behaviors observed at the Bulnay fault system in Mongolia, Undergraduate Thesis, Lehigh University, PA, USA.
- [1] **Sirorattanakul, K.** and Harms, E. (2016), Preparation of LCLS-II 1.3 GHz prototype cryomodule testing at Fermilab, Final report for Lee Teng Undergraduate Internship in Accelerator Science and Engineering, Batavia, IL, USA.

## PATENT PENDING

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- [1] Fang, Z., Tan, Y., Rijken, P. and **Sirorattanakul, K.** Induced seismicity history matching and forecasting, USA Patent Pending, supported by Chevron Corporation.

## INVITED TALKS AND SEMINARS

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- [5] École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland 10/2022  
*What drives earthquake swarms? Insights from the 2020 Westmorland, California swarm and fluid-induced laboratory earthquakes*
- [4] Geomechanics Chapter, Chevron Technical Center, Houston, TX, USA 08/2022  
*From Newton's sliding blocks to earthquake sequences, a geomechanical view of frictional interfaces*

- [3] Geophysics Seminar, University of California, Los Angeles (UCLA), CA, USA 04/2022  
*What drives earthquake swarms? An insight from the 2020 Westmorland swarm in the Salton Trough, California*
- [2] James S. Knowles Lectures and Solid Mechanics Symposium, Pasadena, CA, USA 03/2020  
*Injection fluids in laboratory scale earthquake faults*
- [1] Lehigh Valley Amateur Astronomical Society (LVAAS), Allentown, PA, USA 02/2018  
*Unfolding mysterious evolution of Cepheids*

## FIRST-AUTHORED CONFERENCE PRESENTATIONS (n=10)

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- [10] **Sirorattanakul, K.**, Ross, Z. E., Khoshmanesh, M., Cochran, E. S. and Avouac, J.-P., The 2020 Westmorland, California earthquake swarm as aftershocks of a slow slip event sustained by fluid flow, *American Geophysical Union Fall Meeting*, Chicago, IL, USA, December 12-16, 2022, Oral Presentation S56A-02.
- [9] **Sirorattanakul, K.**, Ross, Z. E., Khoshmanesh, M., Cochran, E. S. and Avouac, J.-P., The 2020 Westmorland, California earthquake swarm as aftershocks of a slow slip event sustained by fluid flow, *Statistical International Seismology Conference*, Cargese, France, October 17-21, 2022, Oral Presentation.
- [8] **Sirorattanakul, K.**, Ross, Z. E., Khoshmanesh, M., Cochran, E. S. and Avouac, J.-P., The 2020 Westmorland, California earthquake swarm as aftershocks of a slow slip event sustained by fluid flow, *Southern California Earthquake Center (SCEC) Annual Meeting*, Palm Spring, CA, USA, September 11-14, 2022, Poster Presentation #69.
- [7] **Sirorattanakul, K.**, Ross, Z. E., Khoshmanesh, M., Cochran, E. S. and Avouac, J.-P., The 2020 Westmorland swarm in the Salton trough, California as a sequence of non-interacting earthquakes driven by preceding aseismic slip transient, *American Geophysical Union Fall Meeting*, New Orleans, LA, USA, December 13-17, 2021, Oral Presentation S44C-07.
- [6] **Sirorattanakul, K.**, Gualandi, A. and Avouac, J.-P., Imaging slow-slip events in Costa Rica, *American Geophysical Union Fall Meeting*, San Francisco, CA, USA, December 9-13, 2019, Poster Presentation T13D-0308.
- [5] **Sirorattanakul, K.**, Gualandi, A. and Avouac, J.-P., Imaging slow-slip events in Costa Rica, *Southern California Earthquake Center (SCEC) Annual Meeting*, Palm Spring, CA, USA, September 8-11, 2019, Poster Presentation #201.
- [4] **Sirorattanakul, K.**, Shen, C., Huang, H. and Ou-Yang H. D., Osmotic compressibility of colloidal crystals and suspensions measured by dielectrophoresis and fluorescence microscopy, *American Physical Society March Meeting*, Los Angeles, CA, USA, March 5-9, 2018, Poster Presentation Section L60.165.
- [3] **Sirorattanakul, K.**, Pepper, J. and Clayton G. C., KELT photometric observations of R Coronae Borealis variables, *American Astronomical Society Meeting #230*, Austin, TX, USA, June 4-8, 2017, Poster Presentation Section 217.05.

- [2] **Sirorattanakul, K.**, Shen, C. and Ou-Yang, H. D., A new technique for measuring concentration dependence of self and collective diffusivity by using a single sample, *American Physical Society March Meeting*, New Orleans, LA, USA, March 13-17, 2017, Oral Presentation Section R17.10.
- [1] **Sirorattanakul, K.**, Huang, H., Uhl, C. and Ou-Yang, H. D., On determination of equation of state of colloidal suspensions, *American Physical Society March Meeting*, Baltimore, MD, USA, March 14-18, 2016, Oral Presentation Section R17.10.

## **NTH-AUTHORED CONFERENCE PRESENTATIONS (n=6)**

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- [6] Mukherjee, S., **Sirorattanakul, K.**, Vargas-Sanabria, D., Patial, S., Silwal, A., Atienza, K. J., Supplementing Earth Observation with Twitter data to improve disaster assessments: A case study of 2020 Bobcat fire in Southern California, *72th International Astronautical Congress*, Dubai, UAE, October 25-29, 2021, Oral Presentation Section B1.5.10.
- [5] Muhire, D. et al. (incl. **Sirorattanakul, K.**), Integrating social media and remote sensing data for flood assessment in developing countries: A case study in Douala estuary, Cameroon, *72th International Astronautical Congress*, Dubai, UAE, October 25-29, 2021, Oral Presentation Section B1.5.9.
- [4] Penney, C., **Sirorattanakul, K.** and Avouac, J.-P., Rheological implications of post-seismic deformation following the 2019 Ridgecrest Earthquakes, *American Geophysical Union Fall Meeting*, Online, December 1-17, 2020, Poster Presentation MR010-0008.
- [3] Hough, S. E. et al. (incl. **Sirorattanakul, K.**), Near-field ground motions from the 2019 M6.4 and M7.1 Ridgecrest, California, earthquakes: subdued shaking due to pervasive non-linear site response?, *American Geophysical Fall Meeting*, San Francisco, CA, USA, December 9-13, 2019, Oral Presentation S42C-01.
- [2] Velterop, E. et al. (incl. **Sirorattanakul, K.**), Current and near-future state of space technology for disaster situations, *70th International Astronautical Congress*, Washington, DC, USA, October 21-25, 2019, Oral Presentation Section B1.1.11.
- [1] Shen, C., **Sirorattanakul, K.**, Huang, H. and Ou-Yang, H. D., An Experimental study of the equation of state of nano colloids using a novel dielectrophoresis osmometer, *American Physical Society March Meeting*, New Orleans, LA, USA, March 13-17, 2017, Oral Presentation Section S17.7.

## **FIELD EXPERIENCE**

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### Seismometers deployment / retrieval

12 seismic nodes, Los Angeles Basin Node Survey, CA, USA (1 day)	2022
12 seismic nodes, BASIN experiment, Los Angeles, CA, USA (2 days)	2019
Rapid response following M4.2 Delaware earthquake, DE, USA (1 day)	2017

### Geophysical imaging (seismic, resistivity, gravity, GPR, magnetic)

Garlock fault, CA, USA (2 days)	2022
Homestead Valley fault, CA, USA (2 days)	2019

## Field Geology

Active tectonics of the Owens Valley fault system, CA, USA (9 days)	2022
Map Piru Gorge sandstone, Pyramid Lake, CA, USA (6 days)	2020
Collect suspended sediments, Wax Lake Delta, LA, USA (7 days)	2019
Survey displaced rocks due to M7.1 Ridgecrest earthquake, CA, USA (1 day)	2019
Map Emigrant Gap Composite Pluton, CA, USA (18 days)	2019
Drone surveys, Owens Valley fault system, CA, USA (10 days)	2018

## Engineering Surveys

Interview-based survey of infrastructures, San Juan Del Sur, Nicaragua (19 days)	2017
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## WORKSHOPS / SHORT COURSES

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SCEC Workshop: Coordinating Post-Earthquake Field Data Collection, Online	2022
ADVANCEGeo Bystander Intervention Workshop, Caltech, CA, USA	2021
SCEC Workshop: Community Geodetic Model Workshop, Online	2021
SCEC-IRIS-UNAVCO Workshop: Rupture and Fault Zone Observatory (RuFZO), Online	2021
Remote Online Sessions for Emerging Seismologists (ROSES), IRIS, Online	2020
NSF Workshop: Modeling Earthquake Source Processes, Pasadena, CA, USA	2018
Accelerator Fundamentals, U.S. Particle Accelerator School, Fort Collins, CO, USA	2016
Asian Science Camp (ASC), Jerusalem, Israel	2012
International Symposium on Green Growth, Hana Academy, Seoul, South Korea	2012

## SYNERGISTIC ACTIVITIES

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Caltech Seismolab Seminar Organizing Committee	2020-21
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### Journal Reviewer for:

- Earth and Planetary Science Letters*: 2020 (n=1)
- Geophysical Research Letters*: 2021 (n=1)
- Journal of Geophysical Research: Solid Earth*: 2022 (n = 1)

## TEACHING

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### Teaching Assistant for:

- Ge111b: Applied Geophysics Seminar and Field Course, Caltech Spring 22
- Ge121a: Advanced Field Geology, Caltech Fall 22
- Ge177: Active Tectonics, Caltech Spring 20, 22

### Grader for:

- ASTR007: Introduction to Astronomy, Lehigh Fall 16-17, Spring 18
- MATH205: Linear Methods Fall 17

**Peer Tutors**, Lehigh's Center for Academic Success for: Spring 15 – Fall 18

- Introductory Physics (PHY010, PHY011, PHY012, PHY013, PHY021, PHY022)
- Calculus (MATH021, MATH022, MATH023)
- Linear Algebra (MATH205)

## COMMUNITY INVOLVEMENT AND LEADERSHIP

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California Institute of Technology, CA, USA

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| Board of Directors, Graduate Student Council (GSC)                 | 2022-   |
| Geological and Planetary Sciences Outreach (GO) Outdoors program   | 2021-   |
| Social media manager, Caltech Letters                              | 2019-   |
| Judge for Perpall Speaker and Gee Poster Competition, SURF program | 2019-20 |

Space Generation Advisory Council

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| Space Tech. for Earth Applications (STEA) Project Group Co-Lead | 2021- |
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Science Olympiad, USA

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| Event supervisor and test writer, Southern California State Tournament | 2019- |
| Event supervisor and test writer, Los Angeles Regional Tournament      | 2019- |

Guest Mentor, Asia Pacific Oceania Space Association

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| Cosmic Sandbox Workshop: Earth Observation for disaster management | 2021 |
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Lehigh University, PA, USA

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| President, Astronomy Club                          | 2016-18 |
| President, Southeast Asia at Lehigh (SEAL)         | 2016-18 |
| Secretary, Society of Physics Students (SPS)       | 2015-17 |
| Recruitment Chair, The Lehigh University Diplomats | 2015-16 |

## PROFESSIONAL ASSOCIATIONS

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| American Geophysical Union (AGU)                                       | 2018-   |
| The Center of Geomechanics and Mitigation of Geohazards (GMG), Caltech | 2018-   |
| Space Generation Advisory Council (SGAC)                               | 2018-   |
| American Physical Society (APS)  | 2016-18 |
| Lehigh Valley Amateur Astronomical Society (LVAAS)                     | 2016-18 |
| Society of Physics Students (SPS), Lehigh University Student Chapter   | 2014-18 |
| Engineers without Borders (EWB), Lehigh University Student Chapter     | 2014-18 |