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# NATASHA TOGHRAMADJIAN

**PhD Student in Geophysics and NSF GRFP Fellow**


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## EXPERIENCE

### U.S. Fulbright Research Fellow

***Seismology without Borders: Geological Rifts and Political Shifts in the Caucasus***

Sept 2017 – June 2018  Yerevan, Armenia

**Seismology researcher on Caucasus-wide "Transect Project"**

- International field work servicing seismic stations
- Manually collected and logged decades of analog seismic bulletins; relocated events with improved precision using HYPO71
- Cellular Seismology analysis of reservoir-triggered seismicity
- Interviewed key international figures to explore the project's capacity to transcend regional conflicts

### National Institute of Geological Sciences

**Summer Intern**

June – July 2016  Yerevan, Armenia

- Digitally picked P and S arrivals in seismograms to determine earthquake characteristics
- Aided in GPR surveys for road construction
- Helped translate field reports from Armenian to English

### National Institute of Seismology & Volcanology

**Summer Intern**

August 2015  Guatemala City, Guatemala

- Assisted in implementing seismic-volcanic monitoring system in the villages of Volcán de Pacaya
- Ash sample collection in pyroclastic ravines of Volcán de Fuego

### Jemez Pueblo Natural Resources Department

**Summer Intern**

June – August 2014  Jemez Pueblo, New Mexico

- Wrote water sampling field manual
- Sampled Jemez River water and sediments; air quality tests
- Natural resource meetings with Pueblo and Los Alamos National Laboratories scientists

## PRESENTATIONS

- *Cellular Seismology as a Tool for Exploring Natural and Human-Induced Patterns of Seismicity*. Invited speaker, Weston Observatory Colloquium Lecture Series, Weston, MA (May 2019).
- **N. Toghramadjian**, C. Jiang, M. Denolle. *Characterizing Strong Shaking Hazard in Seattle Using Ambient Noise Seismology*. SSA Talk 2019, Seattle.
- **N. Toghramadjian**, A. Kafka, L. Sargsyan (Dec. 2018). *Cellular Seismology Analysis of Reservoir-Triggered Seismicity Associated with Armenian Dams*. 30 Years After the Spitak Earthquake Conference, Yerevan, Armenia.
- *"Cellular Seismology Analysis of the Caucasus Continental Collision*. Honors Thesis in Geophysics (BC Department Colloquium, May 2017)
- *Oklahoma Has Become Earthquake Country!* Independent Research in Geophysics (BC Department Colloquium, May 2016)
- *Earth Sciences and Native American Pueblo Culture*, Boston College Undergraduate Research Symposium (January 2015).

## AWARDS & FELLOWSHIPS

- **NSF Graduate Research Fellowship** (2019)
- **Theodore H. Ashford Fellowship in the Sciences** (2018)
  Awarded to six Harvard graduate students most likely to make a substantial impact in their field of study and in society
- **U.S. Fulbright Research Fellowship** (2017)
- **Thomas M. Brennan Memorial Scholar** (2013-2017)
- **L. Austin Weeks Undergraduate Field Study Grant** (2016)
- **Boston College Advanced Study Grant** (2014)
  For summer research on the Jemez Pueblo of New Mexico

## RESEARCH FOCUS

**Ground motion amplification and crustal tomography in sedimentary basins**

My research centers on earthquake propagation in sedimentary basins, which are known to trap seismic energy and amplify ground motion during high-magnitude earthquakes. For large urban communities built atop sedimentary basins, this energy amplification means heightened seismic hazard. My desire to better understand and address this threat drives my current, NSF-funded investigation of the Seattle basin, where I deploy broadband and nodal seismometers to investigate the ambient noise field. By cross-correlating these signals, with a focus on the unresolved basin edges and Seattle Fault Zone, I am working to produce improved basin velocity models, ground motion prediction equations, and near-surface tomographic images. My goal is for these results to be applied by seismic engineers to inform building codes and drive life-saving policy changes.

## EDUCATION

### Harvard University

Department of Earth & Planetary Sciences

**Ph.D. Student in Geophysics and NSF Graduate Research Fellow**

Sept 2018 – present

Advised by Dr. Marine Denolle in Earthquake Seismology

### Boston College

Arts & Sciences Honors Program

**B.S. in Geology, Minor in Physics**

Sept 2013 – May 2017

- Honors Senior Thesis in Geophysics
- Independent Research in Geophysics
- *South Dakota School of Mines & Tech., 2016:* Intensive 5-week field course in the Black Hills
- President, Boston College Geology Association
- Sigma Pi Sigma Physics Honors Society
- Three-time Dean's List, 1st Honors

## PUBLICATIONS

## OUTREACH & VOLUNTEERING

- **Science Club for Girls, Volunteer Mentor Scientist**
  Team-teach weekly science lessons to 20+ girls in Boston public schools (2013, 2015, 2018, 2019)
- **Science Olympiad Academic Mentor and Coach**
  Cambridge Rindge and Latin High School (Spring 2019)
- **DayCon Science in the News:** Volunteer Exhibitor (June 2019)
- **Boston College Geology Association**, President (2016-2017)
  Partnered with faculty to run 3 interactive geology seminars
- **BSSA Peer Reviewer** (2018, 2019)
- **Saint James Armenian Church Choir** (2016-present)
- **Astaza Middle Eastern Ensemble**, Violinist (2016-2017)
- **Boston College Symphony Orchestra**, Violinist (2014-2015)
- **Urartu Armenian Women's Choir** (2018–present)
- **TMBMF Scholar Selection Committee** (2019)

## LANGUAGES

Matlab | python | julia

English | Armenian | German | Spanish

## SELECTED FIELD EXPERIMENTS

- **2017-2018:** International field work with the NSF-funded Transect Project: Deployment, servicing and winterization of 30+ broadband seismometers across the Caucasus mountainbelt, in Armenia and Georgia.
- **April 2019:** Urban deployment of 10 broadbands across the Seattle basin, sited at schools, churches, and small businesses. Installed an educational exhibit at each seismic station, and coordinated to have student observers during deployment. The broadbands will be shifted to the bedrock south of the Seattle basin in August 2019.
- **July 2019:** Deployment of 100 PASSCAL nodal seismometers in multiple profiles across the Seattle Fault Zone. All seismometers are hosted in homeowner backyards, and residents are invited to observe the deployment and ask questions. Completed nodal training at PASSCAL in Socorro, NM in May 2019.