

# Dr. Bryant Chow

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**current residence:** Fairbanks, Alaska

## RESEARCH

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|--------------|--|
| 2023–Present | <b>Assistant Professor of Seismology</b><br>University of Alaska Fairbanks (UAF)<br>Geophysical Institute & Department of Geosciences<br>Fairbanks, AK, U.S.A  |
| 2021–2023    | <b>NSF Postdoctoral Fellow</b><br>University of Alaska Fairbanks (UAF), Fairbanks, AK, U.S.A<br><i>“Active tectonics and crustal structure of Northern Alaska”</i><br>Scientific Mentor: Dr. Carl Tape |
| 2021         | <b>Postdoctoral Researcher</b><br>GNS Science, Lower Hutt, New Zealand   |

## EDUCATION

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|-----------|---|
| 2018–2021 | <b>Doctor of Philosophy in Geophysics</b><br>Victoria University of Wellington (VUW), Wellington, New Zealand<br><i>“Adjoint tomography of the Hikurangi subduction zone<br/>and the North Island of New Zealand”</i><br>Advisors: Dr. Yoshihiro Kaneko, Dr. John Townend   |
| 2015–2017 | <b>Master of Science in Geophysics</b><br>Ludwig-Maximilians-Universität München (LMU Munich) &<br>Technische Universität München (TUM), Munich, Germany<br><i>“Analysis of rotational motion amplitudes on local and global scales”</i><br><i>Part I:</i> “The development of a rotational magnitude scale”<br><i>Part II:</i> “Characterization of the Rot3D dataset”<br>Advisors: Dr. Heiner Igel, Dr. Céline Hadziianou, Dr. Stefanie Donner,<br>Dr. Joachim Wassermann |
| 2011–2015 | <b>Bachelor of Science in Physics, minor in German Studies</b><br>University of California Santa Barbara (UCSB), Santa Barbara, CA, U.S.A<br><i>“Determining Love wave phase velocity through<br/>analysis of rotational ground motion”</i><br>Advisor: Dr. Toshiro Tanimoto  |

## MAJOR FUNDING

- NASA EPSCoR [24-2024EPSCoR-0025], 2024 (\$750k; *NASA*)  
*“GRC: The Alaska–Venus analog: synthesizing seismic ground motion and  
wind noise in extreme environments.”*
- SCEC Science Plan Award [22039], 2022 (\$35k; *Southern California Earthquake Center*)  
*“Adjoint Tomography Workflow Applied to California”*
- NSF Postdoctoral Fellowship [2052839], 2021 (\$174k; *National Science Foundation*)  
*“Active Tectonics and Crustal Structure of Northern Alaska”*

## PUBLICATIONS

“Evidence for deeply-subducted lower-plate seamounts at the Hikurangi subduction margin: implications for seismic and aseismic behavior.”

**Bryant Chow**, Yoshihiro Kaneko, and John Townend.

*Journal of Geophysical Research: Solid Earth* (2022): e2021JB022866.  
(*EOS Editors' Highlight: Adjoint Tomography Illuminates Hikurangi Margin Complexity*)

“Strong upper-plate heterogeneity at the Hikurangi subduction margin (North Island, New Zealand) imaged by adjoint tomography.”

**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, Nick Mortimer, Stephen Bannister, and John Townend.

*Journal of Geophysical Research: Solid Earth* (2022): e2021JB022865.

“An automated workflow for adjoint tomography — waveform misfits and synthetic inversions for the North Island, New Zealand.”

**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.

*Geophysical Journal International* 223.3 (2020): 1461-1480.

“Love wave amplitude decay from rotational ground motions.”

**Bryant Chow**, Joachim Wassermann, Bernhard S.A. Schubert, Céline Hadziioannou, Stefanie Donner, and Heiner Igel.

*Geophysical Journal International* 218.2 (2019): 1336-1347.

“Ultra-long duration of seismic ground motion arising from a thick, low-velocity sedimentary wedge.”

Yoshihiro Kaneko, Yoshihiro Ito, **Bryant Chow**, Laura M. Wallace, Carl Tape, Ronni Grapenthin, Elisabetta D’Anastasio, Stuart Henrys, and Ryota Hino.

*Journal of Geophysical Research: Solid Earth* 124 (2019): 10347-10359

“An event database for rotational seismology.”

Johannes Salvermoser, Céline Hadziioannou, Sarah Hable, Lion Krischer, **Bryant Chow**, Catalina Ramos, Joachim Wassermann, Ulrich Schreiber, André Gebauer, and Heiner Igel.

*Seismological Research Letters* 88.3 (2017): 935-941

“Seasonal variations in the Rayleigh-to-Love wave ratio in the secondary microseism from colocated ring laser and seismograph.”

Toshiro Tanimoto, Céline Hadziioannou, Heiner Igel, Joachim Wassermann, Ulrich Schreiber, André Gebauer, and **Bryant Chow**.

*Journal of Geophysical Research: Solid Earth* 121.4 (2016): 2447-2459

## TEACHING & ADVISING

- **Thesis Committee Member:**
  - Amanda McPherson (UAF PhD; primary Carl Tape)
  - Aakash Gupta (UAF PhD; primary Carl Tape)
  - Logan Scamfer (UAF MSc; primary David Fee)
- **Teaching Assistant:** UAF GEOS 692 (*Reading Seminar*), VUW ESCI 451 (*Active Earth*)

## SERVICE

- **Peer Reviewer:** *Nature Geosciences*, *National Science Foundation*, *Journal of Geophysical Research*, *Geophysical Research Letters*, *New Zealand Journal of Geology and Geophysics*
- **Committees:**
  - 2024 – Present: UAF GI DEI Committee
  - 2024: CIG Community Meeting Steering Committee
- **Workshops:**
  - 2024 SCOPED Workshop: CyberTraining for Seismology (*Co-host*)
  - 2024 SPECFEM Developers Workshop (*Organizer, Chair*)
  - 2023 High Performance Seismology (*Co-host*)
  - 2022 SPECFEM Users Workshop (*Lead host and workshop designer*)

- 2022 Moment Tensor Uncertainty Quantification (MTUQ) Virtual Workshop (*Co-host*)
- **Convener/Chair:**
  - SSA2024: *3D wavefield simulations: from ground motion modeling to seismic imaging*
  - AGU2023: *Online Poster Session for Seismology VI*

## AWARDS & HONORS

- Arctic Fellow Award, 2024 (\$9.7k; *UAF Center ICE*)  
*“Advancing Field-Based Cryoseismology in Arctic and Subarctic Alaska.”*
- Innovative Technology and Education (ITE) Award, 2024 (\$5k; *UAF URSA*)  
*“Upgrading a high-precision gravimeter for improved hands-on lab experience in an undergraduate geophysics course.”*
- New Zealand Geophysics Prize, 2023 (*Geoscience Society of New Zealand*)
- EOS Editors’ Highlight, 2022 (*American Geophysical Union*)  
*Chow et al. (2022b): “Evidence for deeply-subducted lower-plate seamounts at the Hikurangi subduction margin: implications for seismic and aseismic behavior.”*
- Faculty of Graduate Research Dean’s List PhD Recipient, 2021 (*VUW*)
- SSA Annual Meeting Travel Grant, 2021 (*Seismological Society of America*)
- Jim Ansell Geophysics Scholarship, 2020 (*Geoscience Society of New Zealand*)
- Best Oral Presentation, GSNZ Annual Conference 2020 (*Geoscience Society of New Zealand*)
- Beanland-Thornley Student Talks Prize Winner, 2019 (*Geoscience Society of New Zealand*)
- Young Researcher Travel Grant, 2019 (*Geoscience Society of New Zealand*)
- Faculty Strategic Research Grant, 2019 Round 1 (*VUW*)
- 2nd Place Poster, Undergraduate Research Colloquium, 2015 (*UCSB*)

## OPEN SOURCE SOFTWARE

- Pyatoa: Misfit quantification and inversion assessment (*Creator & Lead Developer*)
- SeisFlows: Automated inversion workflows on HPCs (*Lead Developer*)
- PySEP: Seismic data extraction and processing (*Lead Developer*)
- Pyflex: Waveform windowing algorithm (*Lead Developer*)
- Pyadjoin: Waveform misfit functions (*Lead Developer*)
- SPECSEM: Spectral element simulation software (*Maintainer*)

## TECHNICAL SKILLS

- **Programming Languages:** Python, Bash, MATLAB, FORTRAN, JavaScript, HTML,  $\text{\LaTeX}$
- **High Performance Computing:** SLURM, MPI, Singularity, ParaView
- **Software Development:** Git, GitHub, Sphinx, Conda, Jupyter, Docker
- **Field Skills:**
  - Seismic instrument deployment (Germany, Italy, Switzerland, New Zealand, Alaska)
  - Offroad 4WD and Utility Task Vehicle driver training (CarNZ; 2018)
  - Wilderness First Aid (SOLO; 2023)
  - Avalanche Safety Level 1 (Alaska Avalanche School; 2023)
  - Firearms Safety (2023)
  - Bear Awareness (UAF; 2024)
  - Snowmachine Basics (UAF; 2024)
  - Glacier Travel and Crevasse Rescue (UAF; 2024)

## ABSTRACTS

\* = student presentation

1. “Seismic Structure of Northern Alaska From Ambient Noise Adjoint Tomography.”  
**Bryant Chow**, Carl Tape  
*Oral presentation at SSA Annual Meeting 2024*
2. “SCOPED Update: A Cloud and HPC Software Platform for Computational Seismology.”  
Marine Denolle, Carl Tape, Yinzhi Wang, Ebru Bozdogan, Felix Waldhauser, Eric Beaucé, **Bryant Chow**, et al.,  
*Poster presentation at SSA Annual Meeting 2024*
3. “Synthetic Inversions for Anisotropic Structures using Wavefield Simulations and Adjoint Methods.”  
\*Aakash Gupta, **Bryant Chow**, Carl Tape  
*Poster presentation at SSA Annual Meeting 2024*
4. “Validating Tomographic Models of Alaska Using 3D Wavefield Simulations.”  
\*Amanda McPherson, Carl Tape, Evans Onyango, **Bryant Chow**, Daniel Peter  
*Poster presentation at SSA Annual Meeting 2024*
5. “Estimating Crustal Velocity Structure in Alaska From Acoustic-to-Seismic Coupling From the 2022 Hunga Eruption, Tonga.”  
Kenneth A. Macpherson, David Fee, Juliann Coffey, Stefan Awender, **Bryant Chow**, Sam Delamere, Matthew Haney  
*Oral presentation at SSA Annual Meeting 2024*
6. “Ambient Noise Adjoint Tomography of Northern Alaska.”  
**Bryant Chow**, Carl Tape  
*Oral presentation at AGU Annual Meeting 2023*
7. “adjTomo: An Open-source, Python Toolkit for Adjoint Tomography and Full Waveform Inversion.”  
**Bryant Chow**, Ryan Modrak, and Carl Tape.  
*Online Poster presentation at AGU Annual Meeting 2023*
8. “Estimating Crustal Velocity Structure in Alaska from Acoustic-to-Seismic Coupling of Infrasonic from the 2022 Hunga Eruption, Tonga.”  
Kenneth A. Macpherson, David Fee, Juliann Coffey, Stefan Awender, **Bryant Chow**, Sam Delamere  
*Poster presentation at AGU Annual Meeting 2023*
9. “Towards Adjoint Tomography of the Nankai and Kyushu Subduction Zones.”  
\*Samridhi Prakash Mishra, Yoshihiro Kaneko, **Bryant Chow**, Shun Adachi, Yusuke Yamashita, and Masanao Shinohara.  
*Poster presentation at AGU Annual Meeting 2023*
10. “Towards adjoint tomography of northern Alaska.”  
**Bryant Chow**, Carl Tape  
*Oral presentation at SSA Annual Meeting 2023*
11. “adjTomo: an open-Source, Python toolkit for adjoint tomography and full waveform inversion.”  
**Bryant Chow**, Ryan Modrak, and Carl Tape.  
*Poster presentation at SSA Annual Meeting 2023*
12. “adjTomo: an open-source Python toolkit for automating seismic waveform inversion.”  
**Bryant Chow**, Ryan Modrak, and Carl Tape.  
*Online Poster presentation at AGU Annual Meeting 2022*
13. “Adjoint tomography of an accretionary wedge and shallow slow-slip regions in the North Island of New Zealand”  
\*Shun Adachi, **Bryant Chow**, Yoshihiro Kaneko  
*Online Poster presentation at AGU Annual Meeting 2022*
14. “Investigation of complex seismic wave propagation in sedimentary basins via 3-D waveform modeling.”  
Yuan Tian, Carl Tape, **Bryant Chow**  
*Oral presentation at AGU Annual Meeting 2022*
15. “adjTomo — automated, open-source workflow tools for adjoint tomography and FWI.”  
**Bryant Chow**, Ryan Modrak, and Carl Tape.  
*Poster presentation at SSA Seismic Tomography 2022*
16. “Adjoint tomography of the Hikurangi subduction zone and the North Island of New Zealand.” **Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, Nick Mortimer, Stephen Bannister, and John Townend.  
*Oral presentation at SSA Annual Meeting 2022*

17. “Adjoint tomography of the Hikurangi subduction zone and the North Island of New Zealand.”  
*Invited seminar at Lawrence Livermore National Lab, Jan. 20, 2022.*
18. “Strong upper-plate heterogeneity and deeply-subducted seamounts at the Hikurangi subduction zone (North Island, New Zealand) imaged by adjoint tomography.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, Nick Mortimer, Stephen Bannister, and John Townend.  
*eLightning presentation at American Geophysical Union Fall Meeting 2021*
19. “Adjoint tomography of New Zealand’s North Island using an automated, open-source workflow.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.  
*Invited Oral presentation at SSA Tomography 2020*
20. “Adjoint tomography of the North Island, New Zealand using an automated workflow.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.  
*Poster presentation at American Geophysical Union Fall Meeting 2020*
21. “An automated workflow for adjoint tomography applied to the North Island, New Zealand.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.  
*Poster presentation at Southern California Earthquake Center Annual Meeting 2020*
22. “An automated workflow for adjoint tomography applied to New Zealand’s North Island.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.  
*Invited Oral presentation at SCEC CVM Workshop 2020*
23. “Adjoint tomography of the Hikurangi subduction zone and New Zealand’s North Island using an automated workflow.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.  
*Oral presentation at Geoscience Society of New Zealand Annual Conference 2020*
24. “A semi-automated adjoint tomography workflow applied to New Zealand’s North Island.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.  
*Oral presentation at American Geophysical Union Fall Meeting 2019*
25. “A semi-automated adjoint tomography workflow applied to New Zealand’s North Island.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Ryan Modrak, and John Townend.  
*Oral presentation at Geoscience Society of New Zealand Annual Conference 2019*
26. “Adjoint Tomography of the Hikurangi Subduction Zone and New Zealand’s North Island.”  
**Bryant Chow**, Yoshihiro Kaneko, Carl Tape, Vipul Silwal, and John Townend.  
*Poster presentation at American Geophysical Union Fall Meeting 2018*
27. “Towards detection of triggered tremor and associated slow slip in New Zealand from transient teleseismic surface waves.”  
**Bryant Chow**, Yoshihiro Kaneko, Satoshi Katakami, Laura Wallace and John Townend.  
*Poster presentation at Geoscience Society of New Zealand Annual Conference 2018*
28. “The development of a rotational magnitude scale.”  
**Bryant Chow**, Andrea Simonelli, Céline Hadziannou, Stefanie Donner, and Heiner Igel.  
*Oral presentation at European Geosciences Union General Assembly 2017*