Ryan K. Cassotto, Ph.D.

ryancassotto@gmail.com • www.rkcassotto.com • linkedin.com/in/ryan-cassotto • https://github.com/rcassotto

ACADEMIC PREPARATION

Earth and Environmental Sciences (Ph.D.) ***2017***
University of New Hampshire, Durham, NH
"Unraveling short-term variations in tidewater glacier flow: Insights from terrestrial radar interferometric studies"

Earth Science: Geology (M.S.) ***2011***
University of New Hampshire, Durham, NH
"*Implications of changing winter fjord ice mélanges for Greenland outlet glacier dynamics"*

Electronic Engineering Technology (B.S.) ***1999***
University of Hartford, Hartford, CT

ACADEMIC RESEARCH POSITIONS

Assistant Research Professor, University of Maine, Orono, ME	2025 - *Present*
Research Scientist II, University of Colorado, Boulder, CO	*2023 - Present*
Research Scientist I, University of Colorado, Boulder, CO	*2020 - 2023*
Post-Doctoral Research Associate, University of Colorado, Boulder, CO	*2018 - 2020*
NASA Earth and Space Science Fellow, University of New Hampshire	*2014 – 2017*
New Hampshire Space Grant Fellow, University of New Hampshire	*2013 – 2014*
Research Assistant, University of New Hampshire	*2011 – 2013*
Teaching Assistant, University of New Hampshire	*2009 – 2011*

PROFESSIONAL EXPERIENCE

University of Maine, Orono, ME ***2025 - present***
Climate Change Institute (CCI)

- Lead Terrestrial Radar Interferometric (TRI) studies of snow, precipitation, and land surface stability in alpine landscapes for Department of Defense (DoD) project.
- Co-Lead TRI study of stability along the compressional ice zone (ice rumples) along McMurdo Ice Shelf, Antarctica.
- Collaborate with geoscientists on geophysical research proposals.
- Mentor graduate students on remote sensing techniques, including Synthetic Aperture Radar (SAR), spectral and GNSS-IR techniques.
- Conduct analyses and provide expertise in geospatial processing for Climate Change Institute faculty and students.

University of Colorado, Boulder, CO ***2018 - present***
Cooperative Institute for Research in Environmental Sciences (CIRES)

- Conduct environmental research, analyzed complex datasets, and contributed to scientific publications at CIRES, enhancing understanding of climate change impacts.
- Lead CIRES-funded TRI study of snow surface properties to improve states of knowledge in snow surface mobility, avalanche safety, and snow water equivalent estimates.
- Lead NASA-funded study on 3D surface flow of Alaskan glaciers using SAR data, developing innovative techniques for monitoring ice dynamics.
- Co-lead NASA project to map wildfire burn areas in near-real time using SAR observations.
- Pioneered SAR layover technique to observe urban height changes, enhancing Earth Observation applications.

- Co-investigate NSF-funded research on natural hazards in Greenland, contributing to early warning detection systems and conducting fieldwork.
- Authored dozens of technical proposals to funding agencies, successfully attaining grants for eight.
- Developed the CIRES mentorship program, fostering diversity, collaboration, and enhancing employee morale among junior and senior researchers.
- Collaborate with computer scientists and researchers to implement containerized workflows on High-Performance Computing clusters, increasing processing efficiency and reducing processing time.
- Spearhead research initiatives, presenting findings at prestigious institutions and conferences.
- Co-developed and current instructor for FieldSafe, an online-hybrid workshop to promote safe, diverse, and inclusive field teams for CIRES 800 employees.
- Developed novel research methodologies, leading to breakthroughs in environmental science and fostering interdisciplinary collaboration at the University of Colorado.

University of New Hampshire, Durham, NH ***2008 - 2017***

- Developed novel algorithm utilizing MODIS thermal infrared data to assess proglacial winter ice mélange variations in Greenland fjords.
- Applied cutting-edge remote sensing techniques to measure fast-flowing Greenland tidewater glaciers, advancing climate change research.
- Pioneered terrestrial radar interferometry applications for high-precision surface deformation studies, revolutionizing approaches in glaciology and dam safety monitoring.

L-3 Communications Systems West, Salt Lake City, UT ***2003 - 2007***
Electromagnetic Compatibility (EMC) Engineer

- Fostered cross-functional partnerships, serving as a liaison between engineering, manufacturing, and government contractors to drive project success.
- Led EMC certification for DoD satellite systems, optimizing designs and resolving technical issues to ensure U.S. military standard compliance.
- Partnered with design teams to integrate EMC considerations early in product development.
- Managed cable design engineering team, guiding mechanical and electrical engineers toward improved cable design and rectifying EMC fabrication issues.

Curtis-Straus LLC, Littleton, MA ***1999-2003***
Electromagnetic Compatibility Test Engineer

- Conducted EMC testing and analysis for diverse electronic products, ensuring compliance with FCC and CE standards. Developed innovative solutions for EMC issues.
- Streamlined EMC testing processes, reducing turnaround time and increasing lab efficiency.
- Meticulously documented test results, ensuring compliance with regulatory requirements.
- Attained preferred Field Engineer status through exceptional customer service and interpersonal skills.

Quantum Bridge Communications, Andover, MA ***2000-2001***
Compliance Engineer

- Secured regulatory approvals for two optical networking equipment families, enhancing product marketability and customer satisfaction.
- Optimized EMC design processes, leading to faster product development cycles. Collaborated with cross-functional teams to resolve complex electromagnetic issues.
- Partnered with design teams to integrate EMC considerations early in product development. Provided expert guidance on electromagnetic compatibility to stakeholders.

SELECT PUBLICATIONS

Cassotto, R.K., J. Burton, J.M. Amundson, M. Fahnestock, & M. Truffer. (2021) Granular decoherence precedes ice mélange failure and glacier calving at Jakobshavn Isbræ. *Nature Geoscience*., https://doi.org/10.1038/s41561-021-00754-9

Samsonov, S., K. Tiampo, & **R. Cassotto**. (2021) SAR-derived flow velocity and its link to glacier surface elevation change and mass balance. *Remote Sensing of Environment. (258) https://doi.org/10.1016/j.rse.2021.112343*

Cassotto, R., Truffer, M., Fahnestock, M., Amundson, J. & Burton, J. C. (2021). Two-dimensional Velocities of Ice Mélange from Jakobshavn Isbræ, Greenland. (NSIDC-0765, Version 1). [Data Set]. Boulder, Colorado USA. NASA National Snow and Ice Data Center Distributed Active Archive Center. https://doi.org/10.5067/FKPL8IY02XWS

Cassotto, R.K., M. Fahnestock, J.M. Amundson, M. Truffer, M. Boettcher, S. de la Pena, I. Howat. (2019) Non-linear glacier response to calving events, Jakobshavn Isbræ. *Journal of Glaciology.* 65(249), 39-54 https://doi.org/10.1017/jog.2018.90

Willis, MJ; W.D. Barnhart, **R. Cassotto**, J. Klassen, J. Corcoran, T. Host, B. Huberty, K. Pelletier, & J.F. Knight. (2017) *CaliDEM: Ridgecrest, CA Region 2m Digital Surface Elevation Model.* https://doi.org/10.5069/G998854C

Burton, J.C., J. Amundson, **R. Cassotto**, C.C. Kuo, M. Dennin. (2018) Quantifying flow and stress in ice mélange, the world's largest granular material, *Proceedings of the National Academy of Sciences.* 115(20), 4105-5110. https://doi.org/10.1073/pnas.1715136115

Werner, C., B. Baker, **R. Cassotto**, C. Magnard, U. Wegmuller, and M. Fahnestock. (2017) Measurement of fault creep using multi-aspect terrestrial radar interferometry at Coyote Dam. *Proceedings from the 2017 IEEE International Geoscience and Remote Sensing Symposium (IGARSS).* https://doi.org/10.1109/IGARSS.2017.8127110

Motyka, R.J., **R. Cassotto**, M. Truffer, K.K. Kjeldsen, D. van As, N.J. Korsgaard, M. Fahnestock, I. Howat, P.L. Langen, J. Mortensen, K. Lennert, and S. Rysgaard. (2017) Asynchronous behavior of outlet glaciers feeding Godthabsfjord (Nuup Kangerlua) and the triggering of Narsap Sermia's retreat in SW Greenland. *Journal of Glaciology, 63(238).* https://doi.org/10.1017/jog.2016.138

Cassotto, **R.K**., M. Fahnestock, J.M. Amundson, M. Truffer, and I. Joughin. (2015) Seasonal and interannual variations in ice mélange rigidity and its impact on terminus stability, Jakobshavn Isbræ, Greenland, *Journal of Glaciology, 61(225).* https://doi.org/10.3189/2015JoG13J235

GUEST LECTURES

"Map Interpretation of the Landscape" for Mapping a Changing World, Boulder, CO. Nov 2020 – 2024.

"Remote Sensing, Satellite and Image Maps" for Mapping a Changing World, Boulder, CO. Sep 2020 - 2023

"Terrestrial Radar Interferometry" for InSAR Processing and Interpretation. Boulder, CO. Oct 2020, 2023.

"Paleoclimate" for Our Deadly Planet, Boulder, CO. Dec 2019

"Mass Extinctions" for Our Deadly Planet, Boulder, CO. Sep 2019.

"Ice Flow and Calving Front Dynamics" for The Cryosphere: Ice and Icy Environments. Boulder, CO. Feb 2019.

"The Cryosphere" for Planet Earth, Boulder, CO. Feb 2019.

"Mountain Building and Geodesy" for Introduction to Geology, Boulder, CO. Mar 2018.

AWARDS

CIRES Outstanding Performance Award	2020
University of New Hampshire Graduate Student Research/Scholarship/Creativity Award	2017
Outstanding Student Paper Award (OSPA), AGU Fall Meeting	2015

SKILLS

- Interferometric Synthetic Aperture Radar (InSAR) processing.
- Satellite remote sensing image processing and analysis: InSAR, SAR, Spectral data.
- Geospatial processing and analysis of raster and vector data sets
- Geospatial Tools: GDAL, OGR, geopandas, shapely, RasterIO, Numpy, Xarray, SciPy
- Big Data: Python, MATLAB, Bash, Shell Scripting
- Terrestrial radar interferometry
- Linux OS
- Geographic Information Systems (GIS)
- Algorithm Development
- GNSS systems
- Data visualization
- Git, GitHub
- Public speaking, engagement, and presentations

SYNGERGISTIC ACTIVITIES

Peer Review Panels *2019 – present*
NASA, NSF

Service to CIRES - NOAA *2019 – 2025*
CIRES Members' Council Representative, CIRES Mentoring Program Chairperson, Executive Council Rep

Outreach Engagements *2018 – 2019*
National Ocean Sciences Bowl 'Trout Bowl' Keynote Speaker
Guest Geologist / Glaciologist, Red Hawk Elementary Science Night
Lens on Climate Change Guest Speaker

Mentorship *2014 – present*
Climate Change Institute students, CIRES early-career scientists & *PhD students, UNH Geophysics students*

Manuscript Peer Reviewer *2014 – present*
Journal of Glaciology, Geophysical Research Letters, Remote Sensing of Environment

PROFESSIONAL AFFILIATIONS

- American Geophysical Union (AGU)
- International Glaciological Society (IGS)
- United States Geospatial Intelligence Foundation (USGIF)
- American Association for the Advancement of Science (AAAS)

FIELD EXPERIENCE

May 2025	*Slumgullion Landslide, CO* *Led 4 scientists to retrieve GNSS-IR receivers, perform TRI and GNSS surveying.*
September 2024	*Slumgullion Landslide, CO* Deployed custom-build, low-case GNSS-IR receivers to test for sediment advection.
August 2022	*Nuuk, Greenland* Deploy GNSS receiver for GNSS reflectometry tidal measurements
July 2022	*Juneau Icefield Research Program, Juneau, Alaska* Teaching Instructor on SAR technology and applications in glaciology
October 2014	*Columbia Glacier, Valdez, Alaska* Conducted terrestrial radar interferometric measurements of Columbia Glacier
August 2012	*Jakobshavn Isbræ, Ilulissat Greenland* Performed terrestrial radar interferometric measurements of glacier and ice mélange, time-lapse photogrammetry, tidal measurements
August 2010/11	*Kangiata Nunaata Sermia, Nuuk Greenland*

	Acquired terrestrial radar interferometric measurements of terminus and ice mélange, time-lapse photogrammetry, theodolite and GPS surveys
April 2010	*Jakobshavn Isbræ, Ilulissat, Greenland* Assisted in GPS survey of 2000-meter contour, time-lapse photogrammetry
July-Aug 2009	*Juneau Icefield Research Program, Juneau, Alaska* Excavated snow pits for surface mass balance estimates, Assisted GPS surveying
July 2008	*Castner Glacier, Delta Range, Alaska* Volunteer field assistant for glacial geomorphology project