

Charlene "Charlie" Detelich

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Email: ced237@cornell.edu | **Website:** //detelich.wixsite.com/portfolio

GitHub: //github.com/cedetelich13

Research Interests: Planetary Surface Process, Icy Satellites, Tectonics, Geophysics

Technical Skills: **Programming:** Matlab; Python | **Mapping:** ArcPro/ArcMap | **Modeling:** SatStress-GUI; COMSOL; University of Miami Wave Model (UMWM) | **Graphic Design:** Adobe Suite

Education

Ph.D. - Astronomy | Cornell University | Ithaca, NY Aug. 2022 – Present

Thesis Topic: Icy Satellite Surface Processes

Advisor: Dr. Alexander Hayes

Committee: Dr. Jonathan Lunine, Dr. Riley Culberg, Dr. Alexander Evans (Brown University)

M.S. - Applied Geological Sciences | U. of Alaska Anchorage | Anchorage, AK Aug. 2019 – Aug.2021

Thesis: "Regional Scale Tectonic Features at Argadnel Regio and Agenor Linea, Europa: Evidence in Support of a Plate Tectonic Paradigm"

Advisor: Dr. Simon Kattenhorn

Committee: Dr. LeeAnn Munk, Dr. Louise Prockter (Johns Hopkins Applied Physics Lab)

B.S. - Geology (*cum laude*) | NC State University | Raleigh, NC Aug. 2014 – May.2019

Minors: Meteorology; Graphic Communications

Advisor: Dr. Paul Byrne

Course Projects

Terrestrial Analogs of Europa's Double Ridges | Cornell - Planetary Surfaces Spring 2024

Sample Return from Europa | Cornell - Space Exploration Engineering Fall 2023

Experimental Studies of Europa's Fractures | Cornell - Ocean Worlds Fall 2022

Gas and Oil Opportunities on Alaska's North Slope | U of Alaska - Applied Geophysics Fall 2019

Mission to Venus | NCSU - Spacecraft Exploration of the Solar System Spring 2019

Monitoring Convective Storm Systems in Nashville, TN | NCSU - Remote Sensing Fall 2017

Honors and Awards

Featured Artist (Melding Art & Science Exhibition) | Cornell University 2023

Featured Photographer (2024 GSA Calendar) | GSA 2023

Graduate Student Travel Award – \$500 | GSA 2022

Assigned names to 3 geologic features on Europa (Acacallis, Arachne, and Ancaeus Linea) | IAU 2022

Space Exploration Sector Quick Innovation Award – \$5000 | APL 2022

1st Place in Photography and Computer Art Show | APL 2022

Figure from first author paper featured on journal cover | Icarus 2021

Planetary Geomorphology Image of the Month | IAG 2021

Undergraduate Student Travel Award – \$100 | GSA Southeast 2018

Undergraduate Student Travel Award – \$1000 | NCSU 2018

Dwornik Award for Undergraduate Poster - Honorable Mention | LPSC 2018

Dean's List | NCSU Fall 2015, Spring 2016, Fall 2016, Fall 2018, Spring 2019

Experience

Research/Work

- Graduate Research Assistant — Cornell University** Aug. 2022 – Present
Advisor: Dr. Alexander Hayes
Numerically models of double ridge formation on Europa and wind-driven waves on Titan's lakes and seas
- Associate Professional Staff — Johns Hopkins Applied Physics Lab (APL)** Aug. 2021 – Aug. 2022
Supervisors: Dr. Wes Patterson and Dr. Zibi Turtle
Researched Europa plate tectonics, assisted Europa Clipper Europa Imaging System (EIS) team with camera calibration and science operation center development
- Graduate Research Assistant — University of Alaska Anchorage** Aug. 2019 – Aug. 2021
Advisor: Dr. Simon Kattenhorn
Mapped and modeled fractures on Europa to search for evidence of plate tectonics
- NASA/ORISE Intern — APL** Jun. 2018 – Aug. 2019
Supervisor: Dr. Kim Seelos
Mapped (ArcGIS) aeolian erosion on Mars
- Earth and Planetary Studies Intern — Smithsonian Air and Space Museum** Jun. 2017 – Aug. 2017
Supervisor: Dr. Bob Craddock
Mapped (ArcGIS) fluvial erosion on Mars and conducted field work in Hawai'i
- Research Assistant to Senior Ph.D. Student — NCSU** Jan. 2017 – Dec. 2017
Supervisor: Corbin Kling
Mapped (ArcGIS) tectonic features in Noctis Labyrinthus, Mars
- Independent Research — NCSU** Aug. 2016 – Aug. 2019
Supervisor: Dr. Paul Byrne
Researched geomorphology of Iapetus's Equatorial Ridge

Teaching

- Teaching Assistant (ASTRO 2202) | Cornell University** Fall 2023
Spacecraft Tour of the Solar System: Science, Policy and Exploration | Avg. *student rating*: 9.3/10
- Lead Teaching Assistant (ASTRO 1102) | Cornell University** Spring 2023
Our Solar System | Avg. *student rating*: 9.3/10
- Teaching Assistant (ASTRO 1101) | Cornell University** Fall 2022
From New Worlds to Black Holes | Avg. *student rating*: 9/10

Mission Involvement

- Europa Clipper: Europa Imaging System (EIS)** 2021 – Present
Graduate Affiliate (2022 – Present)
Professional Affiliate (2021 – 2022)

Professional Involvement

Professional Memberships

American Geophysical Union (AGU)	2020 – Present
Geological Society of America (GSA)	2017 – Present

Service and Outreach

Planetary Lunch Organizer Cornell	2023 – Present
Astro Grad Student Network Cornell <i>President (24' - Present); Field Rep (23' - 24')</i>	2022 – Present
Museum in the Dark Cayuga Nature Center <i>Cornell Astronomy Rep.</i>	2022
Advocates for Diverse Abilities APL	2021 – 2022
Geology Club U-Alaska Anchorage	2019 – 2021
College of Arts and Sciences Science Fair U-Alaska Anchorage <i>Geology Club Rep.</i>	2019
Geology Club NCSU <i>President (17' - 19'); Vice President (16' - 17')</i>	2015 – 2019
Sciences Council NCSU <i>Secretary (17' - 18')</i>	2015 – 2019
Volunteer NC Museum of Natural Sciences	2015 – 2019

Invited Talks

"A Brief History of Plate Motions on Europa: Astypalaea, Libya, and Cyclades Macula"

<i>Annual Geological Society of America Conference</i>	Oct. 2022
<i>JPL Icy Collaboration and Exchange (ICE) Speaker Series</i>	May 2022
<i>APL Space Exploration Sector Science Smorgasbord</i>	Apr. 2022
<i>Europa Clipper EIS Science Team Meeting</i>	Mar. 2022
"Defining a Planet" "Defining a Planet" <i>The CosmoQuest Hangout-a-thon (live podcast)</i>	Oct. 2020
Annual "Meet a Scientist" Guest Speaker <i>Abbotts Creek Elementary</i>	2016-2020

Professional Service

Peer Reviews: Icarus (2022), Planetary Science Journal (2021)

Panels: NASA ROSES – Executive Secretary (2021)

Conference Planning and Participation:

Europa Clipper EIS Science Team Meeting – co-chair & moderator	2021
3rd Interstellar Probe Exploration Workshop – graduate notetaker	2020

2023-2031 Planetary Science Decadal White Paper Endorsements:

"Opportunities and Challenges for Structural Geology and Tectonics in the Planetary Sciences, A Critical Zone Network Approach to the Study of Mars"

"Aeolian Processes and Landforms Across the Solar System: Science and Technology Requirements for the Next Decade"

Mentorship

Europa ICONS Intern Juli Keiper (Sophomore Undergraduate)	Summer 2024
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Publications and Abstracts

Publications

2022

Episodic Plate Tectonics on Europa: Evidence for Widespread Patches of Mobile-Lid Behavior in the Antijovian Hemisphere. Collins, G. C., Patterson, G. W., **Detelich, C. E.**, Prockter, L. M., Kattenhorn, S. A., Cooper, C. M., Rhoden, A. R., Cutler, B. B., Oldrid, S. R., Perkins, R. P., & Rezza, C. A. *Journal of Geophysical Research: Planets*, 2022.

2021

The morphology and age of the Iapetus equatorial ridge supports an exogenic origin. **Detelich, C. E.**, Byrne, P. K., Dombard, A. J., and Schenk, P. M. *Icarus*, 2021.

Moons Are Planets: Scientific Reductionism Versus Cultural Teleology in the Taxonomy of Planetary Science. Metzger, P. T., Grundy, W. M., Sykes, M. V., Stern, A., Bell, J. F., **Detelich, C. E.**, Runyon, K., Summers, M. *Icarus*, 2021.

Conference Abstracts

2024

Cracking the Code of Europa's Double Ridges: Using Thermomechanical Modeling to Elucidate Astrobiological Potential. **Detelich, C. E.**, Hayes, A. G., Evans, A., McGovern, P., and Collins, G. *AbGradCon, Poster Presentation*, 2024.

2023

Surfing Extraterrestrial Waves: Solving the Mysteries of Titan's Lakes. **Detelich, C. E.**, Schneck, U. G., Hayes, A. G., Perron, J. T., and Steckloff, J. *American Geophysical Union Conference, Oral Presentation*, 2023.

Titan Waves. **Detelich, C. E.**, Schneck, U. G., Hayes, A. G., Perron, J. T., and Steckloff, J. *Northeast Titan Meeting, Invited Oral Presentation*, 2023.

The Europa Imaging System (EIS): High-Resolution, 3-D Insight into Europa's Geology, Ice Shell, and Potential for Current Activity. Turtle, E. P., ..., **Detelich, C. E.**, et al. *American Geophysical Union Conference, Poster Presentation*, 2023.

The Europa Imaging System (EIS): High-Resolution, 3-D Insight into Europa's Geology, Ice Shell, and Potential for Current Activity. Turtle, E. P., ..., **Detelich, C. E.**, et al. *54th Lunar and Planetary Science Conference, Poster Presentation*, 2023.

2022

A Brief History of Plate Motions on Europa: Astypalaea Linea, Libya Linea, and Cyclades Macula. **Detelich, C. E.**, Collins, G. C., and Patterson, G. W. *Geological Society of America Conference, Invited Oral Presentation*, 2022.

Global-Scale Tidal Forcing and Plate Tectonics have Both Shaped the Tectonic Evolution of Europa. **Detelich, C. E.** and Kattenhorn, S. A. *53rd Lunar and Planetary Science Conference, Poster Presentation*, 2022.

Reconstructing the History of Plate Motions Involved with the Formation of Libya Linea, Astypalaea Linea, and Cyclades Macula, Europa. **Detelich, C. E.**, Patterson, G. W., and Collins, G. C.

53rd Lunar and Planetary Science Conference, Poster Presentation, 2022.

2021

Regional Scale Tectonic Features at Argadnel Regio and Agenor Linea, Europa: Plate Tectonic Evidence or Global Tidal Forcing? Detelich, C. E. and Kattenhorn, S. A. *52nd Lunar and Planetary Science Conference, Oral Presentation, 2021.*

2020

Distribution and Significance of Tectonic Patterns in Argadnel Regio, Europa. Detelich, C. E. and Kattenhorn, S. A. *51st Lunar and Planetary Science Conference, Poster Presentation, 2020.*

Geologic Setting of the Olympus Maculae, Mars. Seelos, K. D., Detelich, C. E., Runyon, K. D., Murchie, S. L., Bishop, J. L., Rogers, A. D., and Kraft, K. E. *51st Lunar and Planetary Science Conference, Poster Presentation, 2020.*

2019

Characterizing Anomalous Wind Eroded Terrain on Mars: The Olympus Maculae. Detelich, C. E., Runyon, K. D., and Seelos, K. D. *50th Lunar and Planetary Science Conference, Poster Presentation, 2019.*

Variably dusty yardangs in Mars' Olympus Maculae. Runyon, K. D., Seelos, K. D., and Detelich, C. E. *EPSC-DPS, 2019.*

2018

Clues to the Aeolian History of Medusa Fossae Materials as Observed in the Dust-Free Windows of the Olympus Maculae, Mars Detelich, C. E., Runyon, K. D., and Seelos, K. D. *Geological Society of America Conference, Oral Presentation, 2018.*

Investigating the Morphology of the Iapetus Equatorial Ridge. Detelich, C. E., Byrne, P. K., Dombard, A. J., and Schenk, P. M. *49th Lunar and Planetary Science Conference, Poster Presentation, 2018.*

2017

Investigating the Morphology of the Iapetus Equatorial Ridge. Detelich, C. E., Byrne, P. K., Dombard, A. J., and Schenk, P. M. *North Carolina State University Undergraduate Research Symposium., Poster Presentation, 2017.*