Charlene "Charlie" Detelich

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Email: ced237@cornell.edu | **Website**: //detelich.wixsite.com/portfolio
Art Portfolio: //https://sites.google.com/view/artbycharlie/home

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

Technical Skills: **Programming:** Matlab; Python; Microsoft Excel; Google Sheets | **Mapping:** ArcPro/ArcMap | **Modeling:** SatStressGUI; COMSOL; University of Miami Wave Model (UMWM) | **Graphic Design:** Adobe Illustrator, Photoshop, and InDesign; Microsoft Word and Powerpoint; Google Docs and Slides

Education

Ph.D. Candidate - 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. - Astronomy | Cornell University | Ithaca, NY — Aug. 2022 – Nov. 2024
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

Scientific Research & Work Experience

Graduate Researcher — 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

Gradaute 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

Honors and Awards

Outer Planets Assessment Group Travel Grant | $1,500 | OPAG 2025
Cranson and Edna B. Shelley Graduate Research Award | Cornell University 2025
Future Investigators in NASA Earth and Space Science and Technology (FINESST) | $150,000 | NASA 2024
Graduate Student Travel Award | $500 | GSA 2022
Space Exploration Sector Quick Innovation Award | $5000 | APL 2022
Assigned names to 3 geologic features on Europa *(*Acacallis, Arachne, and Ancaeus Linea) | IAU 2022
Dwornik Award for Undergraduate Poster - Honorable Mention | LPSC 2018
Undergraduate Student Travel Award | $100 | GSA Southeast 2018
Undergraduate Student Travel Award | $1000 | NCSU 2018
Dean's List | NCSU Fall 2015, Spring 2016, Fall 2016, Fall 2018, Spring 2019

Visual Arts Experience

Art Exhibitions

Group Art Exhibition: "December Jurried Show" | *State of the Art Gallery, Ithaca NY* December 2025
Featured Artist at Hound and Mare Cafe | *Ithaca NY* September 2024–October 2025
Group Art Exhibition: "PURPLE" | *Mix Art Gallery, Ithaca NY* October 2025
Solo Art Exhibition: "Planet Pointillism" | *Big Red Barn, Cornell University, Ithaca NY* October 2025
Solo Art Exhibition at Ithaca Gallery Night | *Hound and Mare Cafe, Ithaca NY* April 2024
Solo Art Exhibition at Ithaca Gallery Night | *Hound and Mare Cafe, Ithaca NY* November 2024
Featured Artist at Melding Art & Science Exhibition | *Cornell University, Ithaca NY* November 2023

Honors and Awards

Featured Photographer (2024 GSA Calendar) | GSA 2023
1st Place in Photography and Computer Art Show | APL 2022
Finalist in Alaska Photography Contest | Alaska Rock Gym 2020

Science Communication Experience

Astronomy on Tap | Ithaca, NY | *Co-founder and Branding & Marketing lead* 2024 – Present
Planetary Lunch Organizer | Cornell 2023 – Present
Museum in the Dark | Cayuga Nature Center | *Cornell Astronomy Rep.* 2022
College of Arts and Sciences Science Fair | U-Alaska Anchorage | *Geology Club Rep.* 2019

Volunteer | NC Museum of Natural Sciences 2015 – 2019

Invited Outreach Talks

"NASA's Adventure to Jupiter's Icy Moon, Europa" | *Astronomy on Tap* | *Ithaca, NY* Sept. 2024
"Defining a Planet" | *The CosmoQuest Hangout-a-thon (live podcast)* Oct. 2020
Annual "Meet a Scientist" Guest Speaker | *Abbotts Creek Elementary* | *Raleigh, NC* 2016-2020

Honors and Awards

Figure from first author paper featured on journal cover | Icarus 2021
Planetary Geomorphology Image of the Month | IAG 2021

Teaching Experience

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

TIDES — NASA's Planetary Science Summer School
Proposal Manager & Deputy Systems Engineer (Summer 2025)
Europa Clipper: Europa Imaging System (EIS)
Graduate Student Affiliate (2022 – Present) | Professional Affiliate (2021 – 2022)
Dragonfly
Graduate Student Associate (2024 – Present)

Major Projects

TIDES (mission to Triton) | NASA's Planetary Science Summer School Summer 2025
Terrestrial Analogs of Europa's Double Ridges | Cornell - Planetary Surfaces Course Spring 2024
Sample Return from Europa | Cornell - Space Exploration Engineering Course Fall 2023
Experimental Studies of Europa's Fractures | Cornell - Ocean Worlds Course Fall 2022
Gas and Oil Opportunities on Alaska's North Slope | U of Alaska - Geophysics Course Fall 2019
Mission to Venus | NCSU - Spacecraft Exploration of the Solar System Course Spring 2019
Monitoring Convective Storm Systems in Nashville, TN | NCSU - Remote Sensing Course Fall 2017

Professional Involvement

Community Service and Outreach

Colloquium Committee | Cornell Astronomy | *Student Rep.* Fall 2025 – Present
Europa Clipper Sunrise Group | *Leadership Team* 2025 – Present
Astronomy Graduate Network | Cornell | *President (24' – 25'); Field Rep (23' – 24')* 2022 – 2025

Advocates for Diverse Abilities | APL | *member* 2021 – 2022
Geology Club | U-Alaska Anchorage | *member* 2019 – 2021
Geology Club | NCSU | *President (17' - 19'); Vice President (16' - 17')* 2015 – 2019
Sciences Council | NCSU | *Secretary (17' - 18')* 2015 – 2019

Invited Research Talks

"Surf's Up on Titan: Modeling the seasonality of Wind-Driven Hydrocarbon Waves on Ligeia Mare and Ontario Lacus"
American Geophysical Union Meeting | New Orleans, LA Dec. 2025
"Modeling wind-driven waves on Ontario Lacus and Ligeia Mare, Titan"
Brown University Planetary Lunch | Providence, RI Feb. 2025
"A Brief History of Plate Motions on Europa: Astypalaea, Libya, and Cyclades Macula"
Annual Geological Society of America Conference | Denver, CO Oct. 2022
JPL Icy Collaboration and Exchange (ICE) Speaker Series | Virtual May 2022
APL Space Exploration Sector Science Smorgasbord | Laurel, MD Apr. 2022
Europa Clipper EIS Science Team Meeting | Laurel, MD Mar. 2022

Professional Service

Peer Reviews: Icarus (2022), Planetary Science Journal (2021)
Panels: NASA ROSES — Executive Secretary (2021), NASA SCUBED — Executive Secretary (2025)
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 (UMass Amherst) | Sophomore Undergraduate Summer 2024

Professional Memberships

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

Publications (*lead author)

2025

***3D Geodynamical Modeling of Sill Driven Double Ridge Formation on Europa.** **Detelich, C. E.**, Evans, A., McGovern, P., Hayes, A. G., Dombard, A., Collins, G. C. *2025.* (in prep)
***Evidence in Support of a Plate Tectonic Paradigm for Europa: A Tectonic Study of Argadnel**

Regio and Agenor Linea. **Detelich, C. E.**, Kattenhorn, S. A., *2025.* (in prep)

*__Numerical Modeling of Wind-Driven Waves on Titan's Hydrocarbon Lakes and Seas.__ **Detelich, C. E.**, Schneck, U. G., Hayes, A. G., Curcic, M., Perron, T., Steckloff, J. *JGR: Planets, 2025.* (in prep)

Modeling Wind-Driven Ocean Waves on Other Planets: Applications to Mars, Titan, and Exoplanets. Schneck, U. G., **Detelich, C. E.**, Curcic, M, Ashton, A. D., Hayes, A. G., Perron, T. *JGR: Planets, 2025.* (in review)

Potential landing sites: a comprehensive reconnaissance assessment of the Europa Clipper trajectory. Scully, J., Belgacem, I., Parekh, R., Grima, C., Phillips, C. B., Craft, K. L., Collins, G. C., **Detelich, C.**, et al., and the Europa Clipper Reconnaissance Focus Group. *Planetary Science Journal, 2025.*

2024

The Europa Imaging System (EIS) Investigation. Turtle, E.P., McEwen, A.S., Patterson, G.W., Ernst, C.M., Elder, C.M., Slack, K.A., Hawkins, S.E., McDermott, J., Meyer, H., DeMajistre, R., Espiritu, R., Bland, M., Becker, M., Centurelli, J., Collins, G.C., Corlies, P., Darlington, H., Derr, C., Daubar, I.J., **Detelich, C.**, et al. *Space Science Reviews, 2024.*

Cycles of Change: Long and Short Term Aeolian Evolution at the Olympus Maculae, Mars. Runyon, K., **Detelich, C.**, Seelos, K., Viviano, C., Buczkowski, D., O'Connor, R., Harryman, J., Peña, A. *Planetary and Space Science, 2024.*

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 (*lead author; +invited talk)

2025

+*__Surf's Up on Titan: Modeling the seasonality of Wind-Driven Hydrocarbon Waves on Ligeia Mare and Ontario Lacus.__ **Detelich, C. E.**, Schenk, U. G., Hayes, A. G., Curcic, M. *American Geophysical Union Conference, 2025.*

*__Cracking the Code to Europa's Double Ridges: Building a 3D viscoelastoplastic model of Europa's lithosphere.__ **Detelich, C. E.**, Hayes, A. G., Dombard, A., McGovern, P., Evans, A. *American Geophysical Union Conference, 2025.*

A New Frontiers Class Mission Concept Study to Explore Triton. Miller, S. G., Alian, O. M., Borrelli, M., Christian, J. R., **Detelich, C.**, Ferreira, J. P., Hon, O., Jhoti, E., Kubas, A. R., Lutz, K. A., Pamerleau, I. F., Pickett, N. B., Rountree, R. D., Sacks, L. E., Thakar, B., Tuggle, J. P., Valantinas, A., Zomerdijk-Russell, S., Nash, A. E., Scully, J. E. C. *American Geophysical Union Conference, Poster Presentation, 2025.*

*Cracking the Code to Europa's Double Ridges: Building a 3D viscoelastoplastic model of Europa's lithosphere. **Detelich, C. E.**, Hayes, A. G., Dombard, A., McGovern, P., Evans, A. *Europa Clipper Team Meeting, Poster Presentation, 2025.*

*Cracking the Code: Developing a 3D Geodynamical Model of Europa's Double Ridges. **Detelich, C. E.**, Hayes, A. G., Dombard, A., Evans, A., McGovern, P. *NASA Outer Planet Assessment Group Meeting, Lighting Talk & Poster Presentation, 2025.*

*Producing Wind-Driven Waves on Titan: Coupling a 4D Wind-Wave Model to Modern GCM Results. **Detelich, C. E.**, Schneck, U. G., Hayes, A. G., Curcic, M., Perron, T. *56th Lunar and Planetary Science Conference, Oral Presentation, 2025.*

*Developing a 3D Geodynamical Model of Europa's Double Ridges. **Detelich, C. E.**, Hayes, A. G., Dombard, A. J., Evans, A. J., McGovern, P. J. *56th Lunar and Planetary Science Conference, Poster Presentation, 2025.*

Using Europa Imaging System (EIS) Color Filters to Characterize Europa's Surface Composition. Keiper, J. C., Trumbo, S. K., **Detelich, C. E.** *56th Lunar and Planetary Science Conference, 2025.*

Potential Landing Sites: A Comprehensive Reconnaissance Assessment of the Europa Clipper Trajectory. Scully, J. E. C., Belgacem, I., Parekh, R., Grima, C., Phillips, Craft, K. L., C. B., Collins, G., **Detelich, C. E.**, Leonard, E. J., Mishra, I., Patterson, W., Prockter, L. M., Stickle, A. M., Sutton, S., Wyrick, D. Y., Elder, C. M., McEwen, A. S., O'Shea, C. M., Turner, J. E., and the Europa Clipper Reconnaissance Focus Group *56th Lunar and Planetary Science Conference, 2025.*

2024

Reconnaissance of potential landing sites by Europa Clipper. Scully, J. E. C., Belgacem, I., Parekh, R., Grima, C., Phillips, C. B., Collins, G., Craft, K. L., **Detelich, C. E.**, Leonard, E. J., Mishra, I., Patterson, W., Prockter, L. M., Sutton, S., Stickle, A. M., Wyrick, D. Y. *American Geophyiscal Union Conference, 2024.*

Waves in Alien Seas. Schneck, U. G., **Detelich, C. E.**, Curcic, M., Ashton, A. D., Perron, J. T., Hayes, A. *American Geophysical Union Conference, 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 & Lightning Talk, 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, 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, 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.*