

CHARLENE “CHARLIE”

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DETELICH

EDUCATION

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

Focus: Planetary Surface Processes (Europa; Titan) | **Advisor:** Alexander Hayes

M.S. Applied Geological Sciences | Univ. of Alaska Anchorage | Anchorage, AK | Aug. 2021

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

Advisor: Simon Kattenhorn | Committee Members: Louise Prockter; Lee Ann Munk

B.S. Geology | cum laude | North Carolina State Univ. | Raleigh, NC | May 2019

Minors: Meteorology; Graphic Communications | **Advisor:** Paul Byrne

TECHNICAL SKILLS

Coding Languages: Matlab, Python, R

Mapping Software: ArcMap, ArcPro

Graphics Software: Adobe suite (Photoshop, Illustrator, InDesign)

Modeling Software: SatStressGUI, TerraFERMA, University of Miami Wave Model (UMWM), Mars GCM

WORK and RESEARCH EXPERIENCE

COMPASSE Research Group Member | Cornell Univ. | Ithaca, NY | Aug. 2022 - Present

Focus: planetary surface processes (Europa; Titan) via numerical modeling

PI: Alexander Hayes

Lead Graduate Teaching Assistant | Cornell Univ. | Ithaca, NY | Jan. 2023 - Present

Course: Our Solar System | Prof: Britney Schmidt & Terry Herter

Graduate Teaching Assistant | Cornell Univ. | Ithaca, NY | Aug. 2022 - Dec. 2022

Course: From New Worlds to Black Holes | Prof: Lisa Kaltenegger & Johnathan Lunine

Associate Professional Staff | JHU Applied Physics Lab | Laurel, MD | Aug. 2021 - Aug. 2022

Roles: Research Europa plate tectonics, assist Europa Clipper EIS team with various instrument and science operation center development tasks

Supervisor: Wes Patterson

Graduate Research Assistant | U. of AK Anchorage | Anchorage, AK | Aug. 2019 - Aug. 2021

Focus: Plate tectonics, Europa | PI: Simon Kattenhorn

NASA/ORISE Intern | JHU Applied Physics Lab | Laurel, MD | June 2018 - Aug. 2019

Focus: Aeolian erosion, Mars

Smithsonian Air and Space Museum Intern | Washington DC | June 2017 - Aug. 2017

Focus: Fluvial erosion, Mars

Research Assistant to Senior Ph.D. Student | NCSU | Raleigh, NC | Jan. 2017 - Dec 2017

Focus: Structural geology, Mars

Undergrad Independent Research Project | NCSU | Raleigh, NC | Aug. 2016 - Aug. 2019

Focus: Geomorphology of Iapetus's equatorial ridge

MISSION INVOLVEMENT

Europa Clipper Europa Imaging System (EIS) Graduate Affiliate | Aug. 2022 - Present

Europa Clipper Europa Imaging System (EIS) Professional Affiliate | Aug. 2021 - Aug. 2022

MAJOR COURSE PROJECTS

Studies of Ocean Worlds Across The Solar System | Cornell Univ. | Fall 2022

Focus: Experimental studies of Europa's fractures

Applied Geophysics for Graduate Students | Univ. of Alaska Anchorage | Fall 2019

Focus: Gas and oil opportunities on Alaska's North Slope

Spacecraft Exploration of the Solar System | NC State Univ. | Spring 2019

Focus: Mission to Venus

Remote Sensing for Meteorologists | NC State Univ. | Fall 2017

Focus: Monitoring convective storm systems in Nashville, TN

PLANETARY SCIENCE COMMUNITY INVOLVEMENT

Professional Society Memberships: American Geophysical Union (AGU) (2020 - Present), Geological Society of America (GSA) - Planetary Geology Division (2017 - Present)

Peer Reviews: Planetary Science Journal (2021), NASA ROSES Panel - Executive Secretary (2021)

Conference Planning and Participation: Europa Clipper EIS Science Team Meeting - Co-Chair and Moderator (JHU APL; March 2021), 3rd Interstellar Probe Exploration Workshop - Graduate Student Note-Taker (Virtual; October 2020)

2023-2032 Planetary Science Decadal Survey 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

EXTRACURRICULAR/VOLUNTEER EXPERIENCE

Astronomy Graduate Student Network at Cornell | Member | Aug. 2022 - Present

Cayuga Nature Center Museum in the Dark | Astronomy Representative | Fall 2022

Advocates for Diverse Abilities Club at APL | Member | Aug. 2021 - Aug. 2022

Geology Club at UAA | Member | Aug. 2019 - Aug. 2021

UAA College of Arts and Sciences Science Fair | Geology Representative | Fall 2019

Geology Club at NCSU | President (2018 - 2019) | VP (2017) | Member (2015 - 2019)

Sciences Council at NCSU | Secretary (2018) | Member | 2015 - 2019

North Carolina Museum of Natural Sciences | Volunteer | 2015 - 2019

FIELD EXPERIENCE

Central Arizona | NC State Regional Geology of North America Course | 1 wk | Fall 2018

Northern California | NC State Regional Geology of North America Course | 1 wk | Fall 2017

Ka'u Desert, Hawai'i | Smithsonian Air and Space Museum Internship | 2 wk | Summer 2017

Central Utah | NC State Field Camp | 2 wk | Summer 2016

AWARDS and HONORS

GSA Graduate student travel award | \$500 | October 2022

Named graduate affiliate of Europa Clipper Mission | August 2022

Assigned three new names to geologic features on Europa via the IAU: Acacallis Linea, Arachne Linea, and Ancaeus Linea | June 2022

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

APL Photography and Computer Art Show 1st Place Winner | May 2022

Named professional affiliate of NASA's Europa Clipper Mission | Nov. 2021

Figure from first author paper featured as Planetary Geomorphology Image of the Month by International Association for Geomorphology | Aug. 2021

Figure from first author paper featured on cover of Icarus volume 367 | March 2021

Finalist in Alaskan Rock Climbing Gym Photography Contest | Aug. 2020

GSA Southeastern Section Undergraduate student travel award | \$100 | Nov. 2018

NCSU Undergraduate Travel Award | \$1000 | March 2018

LPSC Dwornik Award for Undergraduate Poster (Honorable Mention) | March 2018

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

INVITED TALKS

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

Annual Geological Society of America Conference | Denver, CO | Oct. 2022

"A Brief Geological History of Plate Tectonics on Europa"

JPL Icy Collaboration and Exchange (ICE) Speaker Series | virtual | May 2022

"A Brief History of Plate Motions Involved with the Formation of Cyclades Macula, Astypalaea Linea, and Libya Linea"

APL SES Science Smorgasbord | Laurel, MD | April 2022

"A Brief History of Plate Motions Involved with the Formation of Cyclades Macula, Astypalaea Linea, and Libya Linea"

Europa Clipper EIS Science Team Meeting | Laurel, MD | March 2022

"Defining a Planet"

The CosmoQuest Hangout-a-thon (live podcast) | virtual | Oct. 2020

Annual "Meet a Scientist" Guest Speaker

Abbotts Creek Elementary | Raleigh, NC | 2016 - Present

PUBLICATIONS and PRESENTATIONS

Publications

- [1] 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., 2022. Episodic Plate Tectonics on Europa: Evidence for Widespread Patches of Mobile-Lid Behavior in the Antijovian Hemisphere. *Journal of Geophysical Research: Planets*, 127(11).
- [2] **Detelich, C. E.**, Byrne, P. K., Dombard, A. J., and Schenk, P. M., 2021. The

morphology and age of the Iapetus equatorial ridge supports an exogenic origin. *Icarus* 367, 114559.

[3] Metzger, P. T., Grundy, W. M., Sykes, M. V., Stern, A., Bell, J. F., **Detelich, C. E.**, Runyon, K., Summers, M., 2021. Moons Are Planets: Scientific Reductionism Versus Cultural Teleology in the Taxonomy of Planetary Science. *Icarus* 374, 114768.

Conference Abstracts

*Poster Presentation | ** Oral Presentation | +Invited Oral Presentation

[4] Turtle, E. P., (et al.), **Detelich, C.**, (et al.), 2023. The Europa Imaging System (EIS): High-Resolution, 3-D Insight into Europa's Geology, Ice Shell, and Potential for Current Activity Lunar and Planetary Science Conference Abstracts 54, #2532.

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

[6] ***Detelich, C. E.** and Kattenhorn, S. A., 2022. Global-Scale Tidal Forcing and Plate Tectonics have Both Shaped the Tectonic Evolution of Europa. Lunar and Planetary Science Conference Abstracts 53, #2135.

[7] ***Detelich, C. E.**, Patterson, G. W., and Collins, G. C., 2022. Reconstructing the History of Plate Motions Involved with the Formation of Libya Linea, Astypalaea Linea, and Cyclades Macula, Europa. Lunar and Planetary Science Conference Abstracts 53, #2118.

[8] ****Detelich, C. E.** and Kattenhorn, S. A., 2021. Regional Scale Tectonic Features at Argadnel Regio and Agenor Linea, Europa: Plate Tectonic Evidence or Global Tidal Forcing?. Lunar and Planetary Science Conference Abstracts 51, #24611.

[9] ***Detelich, C. E.** and Kattenhorn, K. A., 2020. Distribution and Significance of Tectonic Patterns in Argadnel Regio, Europa. Lunar and Planetary Science Conference Abstracts 51, #1671.

[10] Seelos, K. D., **Detelich, C. E.**, Runyon, K. D., Murchie, S. L., Bishop, J. L., Rogers, A. D., and Kraft, K. E., 2020. Geologic Setting of the Olympus Maculae, Mars. Lunar and Planetary Science Conference Abstracts 51, #2985.

[11] ***Detelich, C. E.**, Runyon, K. D., and Seelos, K. D., 2019. Characterizing Anomalous Wind Eroded Terrain on Mars: The Olympus Maculae. Lunar and Planetary Science Conference Abstracts 50, #1861.

[12] Runyon, K. D., Seelos, K. D., and **Detelich, C. E.**, 2019. Variably dusty yardangs in Mars' Olympus Maculae EPSC-DPS, EPSC-DPS2019-721-1.

[13] ****Detelich, C. E.**, Runyon, K. D., and Seelos, K. D., 2018. Clues to the Aeolian History of Medusa Fossae Materials as Observed in the Dust-Free Windows of the Olympus Maculae, Mars. GSA, Paper #54-8.

[14] ***Detelich, C. E.**, Byrne, P. K., Dombard, A. J., and Schenk, P. M., 2018. Investigating the Morphology of the Iapetus Equatorial Ridge. Lunar and Planetary Science Conference Abstracts 49, #1356.

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