



PLANETARY GEOLOGY DIVISION NEWSLETTER

The Planetary Geology Division of the Geological Society of America

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PGD Chair *Emily Martin* from *The Center for Earth and Planetary Studies, Smithsonian Institution, Washington, D.C.*

Message from the Chair:

Greetings to you all from my tiny desk stuffed into a corner next to a pair of neglected skis and a stunning view of a brick wall. I hope this letter finds you healthy while skillfully navigating the innumerable professional challenges we are all facing in

the midst of a pandemic. I feel like I'm still learning how to more effectively work from home for the foreseeable future.

As I began thinking about the ways the PGD might best support our community during the COVID-19 pandemic, my focus shifted quickly to the racism brought to the forefront by the global protests against systemic racism and police brutality experienced by our Black friends, family, and colleagues.

I have started to focus much of my own time towards educating myself about my own biases, how I have unknowingly contributed to systemic racism in our world, and the actions I can take personally and professionally to help dismantle white supremacy. I wanted to share with you some of the staggering data I have reflected on about race in the Geoscience communities. Geosciences are one of the least racially diverse STEM fields in the US and has remained unchanged over the last [40 years](#). Strides have been made in bringing parity to the balance of genders in the awarding of PhDs, but now that men and women receive PhDs in geosciences at the same rate, women only hold [20%](#) of geoscience faculty positions. Considering that only [~6%](#) of Geoscience PhDs are awarded to BIPOC (Black, Indigenous, and People of Color) each year, how long will it take before we start to see a racially diverse leadership in our field?

The PGD board has collected resources, listed in this newsletter, that we have found useful as we have formed our own individual plans of action to dismantle white supremacist culture and systemic racism in our work, institutions, and homes. This is by no means a comprehensive list, but serves as a starting point to develop your plan of action. I will continue to collect these resources and make a curated list available to

the PGD membership on our website under our [Resources tab](#). I would welcome any contributions you would like to share.

As part of doing this work, it is important to share what actions we are taking both immediately and as part of a long-term strategy. One great resource I'm reflecting on is the work of sociologist [Dr. Janet Vertesi](#), especially her [presentation to the Outer Planets Assessment Group in 2017](#) addressing the critical importance of diversifying our networks and how to acknowledge and combat our own implicit biases. I am considering how I might have a greater impact on bringing a more diverse range of students into the field, and how I may support them on their STEM (hopefully planetary geosciences!) journey in a more inclusive way. I am reevaluating how to modify my recruiting strategies by advertising my funded research and training opportunities through BIPOC specific professional associations (like the [National Association of Black Geologists](#), [Society for Advancing Chicanos/Hispanics & Native Americans in Science](#), or the [National Society of Black Physicists](#)) or at [Historically Black Colleges and Universities](#) (HBCUs).

Due to the COVID-19 pandemic, GSA recently announced that our Annual Meeting will be a virtual experience. As a result, the PGD is working on making this a collaborative and productive scientific meeting for our membership. While GSA develops further guidance and logistics, the PGD is working hard towards including events that we will hold for attendees to not only honor our awardees, but also to help increase collaboration, networking, and discussion around topics like race and racism throughout our community.

[Requests for virtual non-technical events are due to GSA August 4th](#) and we would

encourage PGD members to consider the kinds of events they can host to help us in our efforts to make this unique virtual meeting extra special this year. I would especially like to encourage the PGD community to consider ways in which they may use these virtual, non-technical events to address systemic racism in our field. Furthermore, I would like to encourage our student members to remember our Student Advisory Board who are also available to help make this meeting a success. We are working hard to make this a great (albeit unique) meeting.

The work we do as individuals and as a STEM community to educate ourselves and one another about systemic racism will lead to necessary change. Let's work together to build a more equitable, just, and productive future for planetary geosciences. As always, the PGD board is here for you. If you have questions, comments, or ideas you would like to discuss, please [get in touch](#) with us!

Emily Martin
PGD Chair

PGD 2020 Button Design Winner



Congrats to **Rutu Parekh** from the DLR Institute of Planetary science (Berlin) on her winning 2020 design!

Artwork description: In the past decade, a new era of small planetary bodies exploration has begun - starting with flybys of near-earth asteroids, followed by the Dawn mission (to Vesta and Ceres), and the Rosetta mission (to 67P comet) - which have provided insight into the early formation process of asteroids and comets. Further, with Hayabusa2 and the OSIRIS-REx mission to Ryugu and Bennu, respectively, successful landing and exploration of these small bodies is now possible. These low temperature planetary bodies are all diverse in terms of their composition, shape, size and temperature, as illustrated on the button, and represent an ideology of inclusivity. From the top going counterclockwise: Ryugu, Ceres, Vesta, Bennu, Arrokoth, 67P/Churyumov (dedicated to past missions), Europa, Deimos, Phobos, and Psyche (dedicated to future missions to icy planetary systems)

About the artist: Rutu Parekh is currently in her second year of doctoral research at DLR and her project focuses on how to analyze and understand the role of volatiles in shaping the surface of asteroids which have similar gravitational force but different surface compositions. With this aim, she has been closely working with the Dawn science team and analyzing the high-resolution images of Vesta and Ceres.

Besides being a full-time researcher, she is passionate about science communication and advocate of diversity within research. Her commitment has led her to become part of the Diversity and Early Career committee at Europlanet Society. Recently, she was elected as DLR's PhD representative and Helmholtz Junior coordinator, where a group of representatives from 19 institutes around Germany work together with an aim on

improving working conditions of doctoral researchers.

2019 Dworknik Awards

Due to the COVID-19 pandemic we were unable to acknowledge our Dworknik Award winners from 2019 at the 51st LPSC. We are really proud of our Dworknik participants and all the hard work they do, and we want to continue to draw attention to our winners.

The 2019 Dworknik winners are:

Best Graduate Oral Presentation: **Clara Maurel**, Massachusetts Institute of Technology, “Partial Differentiation and Magnetic History of the IIE Iron Meteorite Parent Body.”

Honorable Mention—Grad Oral: **Xiaochen Mao**, Washington University St. Louis, “Spin Evolution of Ceres due to Impacts.”

Graduate Poster: **Alexandra E. Doyle**, University of California Los Angeles, “Oxygen Fugacities of Rocky Exoplanets from Polluted White Dwarf Stars.”

Honorable Mention—Grad Poster: **Amanda Ostwald**, University of Nevada Las Vegas, “Parental Melt of Nakhilites as Determined from Melt Inclusions.”

Undergraduate Oral: **Patrick Matulka**, Colgate University, “Rounding and Comminution Rates of Ice Clasts Using the Titan Tumbler: Fluctuating Roundness and Stepped Mass Loss.”

Honorable Mention—Undergrad Oral: **Christopher Yen**, Brown University, “An Updated Orbital Analysis of Ancient Strata in Terby Crater, Mars: The Thickest Deltaic Sequence on Mars?”

Undergraduate Poster: **Walter Zimmerman**, University of Alaska Anchorage, “Bands on Europa: A New Geometry-Based Classification to Explain Why Bands Form.”

Honorable Mention—Undergrad Poster: **Steffanie Sillitoe-Kukas**, Florida State University, “Spherules in the Martian Polymict Breccias: I: Origin and Internal Chemical Zoning.”

2019 Dworknik Award Fundraiser

A huge thank you to Past Chair Sharon Wilson Purdy for her huge effort on the Dworknik Fundraiser. Our community raised a total of \$10,040 to support our Dworknik Award. \$5,040 came from the PGD members and/or past Dworknik award winners, plus \$5,000 from our very generous matching donor.

Thanks to Sharon and our generous PGD community for helping us get so close to our fundraising goal! We continue to work hard for our students and promoting their success in planetary geosciences.

Upcoming 2020 Annual Meeting



Mark your calendars for the upcoming virtual 2020 GSA Annual Meeting from October 26-30.

Registration: opens early July

Student Volunteer program: opens early August

Early registration deadline: 21 September

Cancellation deadline: 28 September

More information about the meeting can be found at:

<https://community.geosociety.org/gsa2020/home>

The Planetary Geology Division Business Meeting and Award Ceremony

Due to the online nature of the Annual meeting, we will not be holding our traditional banquet, but we will be hosting a virtual business meeting and awards ceremony.

We are aiming for our virtual get-together to occur on the same day as our special G. K. Gilbert Award session to honor the 2020 Gilbert awardee Dr. Jim Zimbelman! The virtual GSA schedule is still in flux, but we will notify the membership as soon as we know when this session will run so that you can register for it when you register to attend the meeting.

Details about the event will be posted on our website in mid-July, and we will also be sure to notify members when we have additional details:

<https://community.geosociety.org/pgd/home>

PGD Sponsored Sessions at the 2020 Annual GSA Meeting:

Sponsored Sessions:

T114. Best Practices and Exciting Discoveries in Identifying, Mapping, and Analyzing Planetary Landforms and

Terrestrial Analogues. Jeannette Wolak and Kelsey Crane

GSA Planetary Geology Division; U.S. Geological Survey Astrogeology Science Center

We welcome abstracts that investigate the methodology of planetary and terrestrial landform analysis or that explore these methodologies as a means of achieving insight into the evolution of those landforms.

T115. Geomorphology and Landscape Evolution of Mars. Sharon Wilson Purdy and Marisa Palucis

GSA Planetary Geology Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division; GSA Soils and Soil Processes Division

This session explores the formation and modification of landforms on Mars (e.g., impact craters, fluvial features) that can be used as yardsticks to measure the evolution of the surface and constrain the planet's climate history.

T116. Void Spaces on Planetary Bodies. Debra L. Buczkowski and Danielle Y. Wyrick

GSA Planetary Geology Division

This session solicits abstracts on subsurface void spaces and the processes that form them on Solar System bodies. It encompasses surface geology, interior evolution, and comparative planetary studies with observational, experimental, or theoretical approaches.

T117. The G. K. Gilbert Award Session: Flowing and Blowing: Volcanic and Aeolian Deposits Around the Solar System. Emily S. Martin; Sharon Wilson Purdy; and Debra H. Needham

GSA Planetary Geology Division

We solicit abstracts focused on volcanism and aeolian processes across the solar system

to celebrate and highlight the broad impact of Dr. Jim Zimbelman's research. Topics include emplacement of lava flows, transport and deposition of sands, remote sensing, and geologic mapping of terrestrial bodies and terrestrial analog field studies.

T118. Impact Cratering across the Solar System. Jeffrey Plescia and Christian Koeberl

GSA Planetary Geology Division; GSA Structural Geology and Tectonics Division; GSA Geophysics and Geodynamics Division; GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division; GSA Scientific Continental Drilling Division

Impact cratering is a primary geologic process throughout the solar system. The session focuses on the geologic, geochemical and geophysical signatures of impacts, the impact flux, and implications for geologic evolution.

T119. Sedimentary Landscapes across the Solar System: Planets, Moons, and Terrestrial Analogues. Alessandro Ielpi and Mathieu G.A. Lapotre

GSA Planetary Geology Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division

We welcome both state-of-the-art contributions and recent exploits in the broad area of planetary sedimentology and geomorphology, including (bio?) geochemical cycling, and analogue modelling derived from both Precambrian and modern terrestrial systems devoid of macroscopic life.

T122. The Big Picture from Small Worlds: Dwarf Planets, Trans-Neptunian Objects, Asteroids, Comets, and More. Kynan H.G. Hughson, Debra L. Buczowski, and Jennifer E.C. Scully

GSA Planetary Geology Division

Global space agencies have recently conducted a number of missions to “small worlds,” such as asteroids, comets, trans-neptunian objects, and dwarf planets. We welcome abstracts related to geological, geophysical, and/or geochemical analysis of these worlds.

T123. Rocks from Space! Using Meteorites to Understand the Physical, Chemical, and Mineralogical Evolution of Planetary Bodies. Tasha Dunn, Justin Filiberto, and Christopher D.K. Herd

GSA Planetary Geology Division; Mineralogical Society of America; Geochemical Society; GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division

This session will highlight the role that laboratory studies of meteorites (e.g., petrographic and mineralogical studies, geochronology, and isotopic analysis) play in advancing our understanding of planetary body evolution (asteroids, the moon, and Mars).

T124. To Boldly Go: Thoughts, Approaches, and Examples for Teaching Planetary Science and Integrating Students into the Research Process.

Nicholas P. Lang and Jennifer L.B. Anderson
GSA Planetary Geology Division; GSA Geoscience Education Division

This session explores approaches used to teach planetary science content to students at the K-12, college, and graduate levels. Approaches to successfully integrating students at each level into the research process will also be addressed.

2020 GSA Fellows

Alfred McEwen (University of Arizona): Elected into GSA fellowship as the 2019 G. K. Gilbert Awardee.

2020 Pellas-Ryder Award

The Pellas-Ryder award is given to the Planetary Science Best Student Paper published during the preceding year. The award is jointly given by the Meteoritical Society and the Planetary Geology Division of the Geological Society of America and includes a \$500 award from the Meteoritical Society and a plaque awarded by the PGD.

This year's Pellas-Ryder award was awarded to **Sabrina Raducan**, currently a PhD student in the Department of Earth Science and Engineering at Imperial College, London. Her paper was titled "The role of asteroid strength, porosity and internal friction in impact momentum transfer" and was published in *Icarus* in 2020. Sabina has been part of the NASA Double Asteroid Redirection Program (DART) investigation team that examines the use of an impactor spacecraft for planetary defense against potential threats posed by Earth-crossing asteroids. Supervised by Gareth Collins, she applied the iSALE shock physics code to model the effect of asteroid properties (cohesion, porosity, internal fraction) on ejecta momentum distribution and to calculate the resulting deflection induced by the impactor. Sabina's important contributions with this study involved modifying the iSALE code to track high-speed, early ejecta in a computationally efficient manner with the model and modifying ejecta scaling laws. Her work will be essential in interpreting the results of the DART mission and more generally in

developing planetary defenses against asteroidal threats.



Raducan, S. D., Davison, T. M., Luther, R., and Collins, G. S. (2019). The role of asteroid strength, porosity and internal friction in impact momentum transfer. *Icarus*, 329, 282-295.

Call for Applications & Nominations

Ronald Greeley Award for Distinguished Service: The PGD is now accepting nominations for the 2020 Ronald Greeley Award for Distinguished Service, and all members are encouraged to submit nominations. This award was established in 2011 as the PGD Distinguished Service Award, and in 2012 the PGD membership voted to change the name to commemorate Ronald Greeley and his contributions to the Planetary Geology Division. This award may be given to those members of the PGD, or those outside of the Division and GSA, who have rendered exceptional service to the PGD over a multi-year period. The award is not open to currently serving Division officers, but may be awarded to past officers who have

provided exceptional service to the PGD after their term on the Management Board has ended. *Nominations for the award, which should include a description of what the nominee has given to the PGD community, may be made by any PGD member prior to **June 30, 2020**.* Approval of the award will be by majority vote of the Management Board. The award consists of a certificate signed by the Chair, and will be presented at the Division's Virtual Business Meeting at the Annual Meeting.

Eugene M. Shoemaker Award: Dr. Carolyn Shoemaker established the Eugene M. Shoemaker Memorial Fund for Crater Studies in memory of her husband in 1998. She established this endowment so that students will have an opportunity to pursue studies of impact craters, which were the focus of her husband's graduate studies and a large part of his professional career. Friends, scientific colleagues, and companies have contributed to the fund (and continue to do so) to ensure its success.

The Shoemaker Impact Cratering Award is for undergraduate or graduate students, of any nationality, working in any country, in the disciplines of geology, geophysics, geochemistry, astronomy, or biology. The award, which will include \$3000, is to be applied for the study of impact craters, either on Earth or on the other solid bodies in the solar system. Areas of study may include but shall not necessarily be limited to impact cratering processes; the bodies (asteroidal or cometary) that make the impacts; or the geological, chemical, or biological results of impact cratering. *The electronic application form opens on or around **July 1, 2020**, and must include a CV, research proposal, timeline and budget, and two letters of recommendation.* For more details and to access the online application forms, go to:

http://www.lpi.usra.edu/science/kring/Awards/Shoemaker_Award/.

Questions regarding this award should be directed to Dr. David Kring, (kring@lpi.usra.edu). The Planetary Geology Division officers strongly encourage all of our Division members to actively recruit promising students to apply for this prestigious award.

Selected Upcoming Meetings & Workshops

For a detailed list of upcoming meetings and workshops, please see the Lunar and Planetary Science meetings calendar here: <https://www.hou.usra.edu/meetings/calendar/>

2020 Annual Meeting of Planetary Geologic Mappers:

The purpose of the annual meeting of planetary geologic mappers is to report progress on NASA-funded geologic mapping projects. Other planetary geologists who are conducting geologic mapping are also welcome to attend. The meeting serves as a venue to discuss problems and issues relevant to the planetary mapping community. Findings are determined from plenary discussion sessions and then presented to the MAPSIT Steering Committee to forward to NASA Headquarters Program Officers. The meeting usually includes a GIS Q&A session with USGS scientists, but due to unforeseen circumstances, this opportunity is unavailable. However, plans to have future detailed discussions with USGS scientists will be discussed during this meeting.

A virtual meeting will take place on July 23, 2020. The abstract deadline has passed but the registration deadline is July 20, 2020.

For more information:

<https://www.hou.usra.edu/meetings/pgm2020/>

11th Planetary Crater Consortium Meeting

The 11th PCC meeting is open to planetary and terrestrial scientists interested in any aspect of impact cratering on solar system bodies. We welcome abstracts related to observational, theoretical, experimental, and/or numerical modeling studies of impact craters on planets, dwarf planets, moons, asteroids, comets, or other small solar system objects. This year, we particularly encourage discussions on the use of topographic data for the analysis of craters on any planetary body.

The annual meeting is designed to encourage and provide adequate time for in-depth discussion of crater-related issues and research topics to enhance collaborations. Talks are typically allocated at least 30 minutes, with questions being asked during the presentation. Additional discussion time is set aside at the end of the morning and afternoon sessions. A major goal of the meeting is to provide feedback in a relaxed and friendly environment and discuss potential new avenues of collaborative crater research.

A virtual meeting will take place August 5-7, 2020. The registration deadline is July 30, 2020. For more information: <https://www.hou.usra.edu/meetings/crater2020/>

The Venus Exploration Analysis Group:

The Venus Exploration Analysis Group is NASA's community-based forum designed to provide scientific input and technology development plans for planning and prioritizing the exploration of Venus over the next several decades. VEXAG is chartered by NASA's Solar System Exploration Division

and reports its findings to NASA. Open to all interested scientists, VEXAG regularly evaluates Venus exploration goals, scientific objectives, investigations, and critical measurement requirements, including especially recommendations in the NRC Decadal Survey and the Solar System Exploration Strategic Roadmap.

The 18th meeting of VEXAG will be held **November 16-18**, in Pasadena, CA. For more information, see <https://www.lpi.usra.edu/vexag/meetings/vexag-18/>

Annual Meeting of the Lunar Exploration Analysis Group:

The Annual Meeting of the Lunar Exploration Analysis Group (LEAG) will be a virtual meeting from **September 14-16, 2020**. For more information, see <https://www.hou.usra.edu/meetings/leag2020/>

Community Resources

Employment Opportunities and Preparation

GSA Geoscience Job board:

https://www.geosociety.org/GSA/Education_Careers/Job_Board/GSA/GSAToday/Job_Board.aspx

Women in Planetary Science Blog:

<https://womeninplanetaryscience.wordpress.com/jobs/>

AGU's Planetary Science Section:

<https://connect.agu.org/planetarysciences/home>

American Astronomical Society Division for Planetary Sciences:

<https://dps.aas.org/jobs>

Chronicle of Higher Education:

<https://jobs.chronicle.com/>

Higher Ed Jobs:

<https://www.higheredjobs.com/>

Discussion of work-force preparation:

<https://serc.carleton.edu/geoneeds/professionals.html>

The Professor is in:

<http://theprofessorisin.com/>

Inclusion, Diversity, and Equity

SERC on Diversity:

https://serc.carleton.edu/advancegeo/resources/what_diversity.html

Books:

Robin DiAngelo's *White Fragility*

Ibram X. Kendi: *How to be an Antiracist*

Podcasts:

Brene with Ibram X. Kendi on How to be an Antiracist:

<https://open.spotify.com/episode/101adQusstyZ2SvzP1DKok?si=n6EPxPuYSYCTS08DW76Zg>

Antiracism resources (books, articles, movies, podcasts):

bit.ly/ANTIRACISMRESOURCES

Remote Education

Flower Darby's *Small Teaching Online*

Special Thank You!



We wanted to end this newsletter with a special thank you to our outgoing Senior Student Advisory Member, Mallory Kinczyk. Mallory has been a valuable member of the PGD officer crew for two years and we have greatly appreciated her contributions to, and support of, our student membership. Mallory is a PhD candidate at North Carolina State University, who uses finite element modeling and spacecraft observations to determine stresses and fault propagation on icy satellites. Thank you for your service Mallory, and we very much look forward to continuing to work with you!

We need your help!

This would be a great time to contribute to the Dwornik, Shoemaker, or student travel grant funds! Unlike many other charitable donations, your donation to these funds will produce positive results you can see for yourself as you encourage and support planetary scientists, both current and future. Donations can either be made online (<https://gsa-foundation.org/>) or by mail. If by mail, please include a check or money order, made payable to *Planetary Geology Division, GSA*.

YES I have enclosed a check as a donation to:

The Dwornik Fund amount \$(_____)

The Shoemaker Fund amount \$(_____)

PGD Student Travel Grants amount \$(_____)

WHEN MAKING A DONATION, PLEASE INCLUDE THIS DONATION FORM AND PAYMENT CHECK IN AN ENVELOPE AND MAIL THEM TO:

The Geological Society of America
P.O. Box 9140
Boulder, CO 80301-9140.

Need more information about PGD? Check out our website:

<https://community.geosociety.org/pgd/home>

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