



PLANETARY GEOLOGY DIVISION NEWSLETTER

The Planetary Geology Division of the Geological Society of America

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Message from the Chair

Happy New Year!

I am honored and humbled to serve as your PGD Chair for 2016-2017.

It was wonderful to see many of you at our Annual Meeting in Denver. GSA is my favorite yearly conference, and hopefully one of yours, too! As an unabashed “squiggly line” enthusiast, I especially enjoyed the Mineral Spectroscopy session honoring Gilbert Awardee Darby Dyar. Darby’s own talk described her pioneering use of machine learning techniques, which in the coming years may revolutionize a broad range of data analyses. But for me, even more memorable was hearing Darby’s personal recollections at our PGD Banquet of the career challenges she has overcome. Her story, along with the gratitude expressed by so many students and



PGD Chair *James Wray*
from The School of Earth and Atmospheric Sciences at Georgia Institute of Technology

colleagues whose careers she has helped launch or lifted, are deeply inspiring. These opportunities to learn from the real-world experiences of the most accomplished leaders in our field are one of many reasons why I would encourage all division members, and especially students and early-career members, to attend our Annual Meeting banquets if at all possible. The food is always good, and the company even better.

Modern advances in planetary geology are clearly tied to our government-funded spacecraft missions, and so we closely monitor the national and international political winds. NASA is one of the few federal agencies that enjoys broad bipartisan support and high public approval. Although we are entering a period of change and transition, it is an opportunity to renew our commitment to all of science and space exploration that continues to inspire the next generation of scientists and engineers.

One thing that obviously must not change is our community's commitment to inclusivity. To illustrate this, I will simply reiterate Danielle Wyrick's words from last year's January newsletter: "The PGD board remains committed to ensure that all our members – regardless of gender, race, orientation, age – enjoy attending our annual conference and benefit fully from community feedback and interaction. To that end, please do not hesitate to contact any board member (listed at the end of the newsletter) if you have concerns regarding issues of diversity or abuse in our community." To me, GSA meetings engender a uniquely strong feeling of camaraderie, and I hope that is your perspective too. If it is not, then I sincerely hope you will share your concerns and suggestions, even anonymously if you prefer. In any case, I thank you for your

support of PGD, and encourage you to remain engaged.

We certainly have much to look forward to in 2017. For the first time in generations, in August a total solar eclipse will be visible across a broad swath of the continental US; if you'll be traveling to witness this yourself (I will!), then I encourage you to take family and friends with you. This year we'll also see Cassini's long mission at Saturn achieve its spectacular Grand Finale, and possibly also the first return of lunar samples to the Earth in over 40 years, via China's Chang'e-5...which may be racing to the Moon against several Google Lunar XPrize teams. Meanwhile, OSIRIS-REx will continue its journey to asteroid Bennu, the ExoMars Trace Gas Orbiter will aerobrake into its science orbit at Mars, and—we have just learned—work will begin on not one, but two, new Discovery missions to explore the planetary geology of strange new worlds in the main asteroid belt and beyond. What an exciting time for our field.

I hope to see you at an upcoming meeting! After LPSC in March, I plan to be at GSA's Cordilleran Section meeting in Honolulu (May 23-25), this year featuring as many as **five** planetary-themed sessions! And then, of course, we are all looking forward to the 2017 Annual Meeting in Seattle. There our division booth in the Exhibition Hall will once again serve as not only an excellent place to start your Christmas shopping (this worked very well for me last year), but also the best place for planetary scientists to network at the meeting! Whenever I'm not in a session, I am usually at the booth.

Best wishes for a healthy and productive 2017,

James Wray, PGD Chair

Upcoming 2017 Annual Meeting



Mark your calendars for the 2017 GSA Annual Meeting in Seattle, Washington from October 22-25.

Abstract submission is not yet open, but the first announcement can be viewed here:

www.geosociety.org/GSA/Events/AnnualMeeting/GSA/Events/gsa2017.aspx

Call for Technical Session proposals: Help ensure that your area of research and expertise is represented in next year's technical program. Any individual or geosciences organization is welcome to suggest topics and submit proposals for both Topical Sessions and Pardee Keynote Symposia. Pardee Symposia are high-profile sessions on significant scientific developments, with invited speakers only. Topical Sessions are a combination of invited and volunteered papers. Unique formats are allowed, but must be outlined in the proposal along with the technical support needs. Sessions that promote discussion are encouraged. **Due February 1, 2017.**

<https://gsa.confex.com/gsa/2017AM/cfs.cgi>

Call for Short Course proposal: Have something that your peers need to know? Lead a Short Course at the GSA 2017 Annual Meeting in Seattle. Courses can be run to develop professional, teaching, and research skills at all levels. **Due February 1, 2017.**

<https://gsa.confex.com/gsa/2017AM/shortcourse/cfs.cgi>

Notes from the 2016 GSA Annual Meeting in Denver, Colorado

The 2016 annual GSA meeting was held in Denver, Colorado September 25-28. The meeting continues to be a major annual event for the PGD community.

Among the meeting highlights was the annual PGD banquet and celebration of Prof. M. **Darby Dyar**, the recipient of the 2016 G.K. Gilbert Award, our division's highest honor. See Page 10 for more details.



Outgoing PGD chair **Danielle Wyrick** of Southwest Research Institute (left) presenting the G. K. Gilbert award plaque to **Darby Dyar** (right) of Mount Holyoke College at the 2016 PGD banquet in Denver.

Our division also continued the tradition of hosting a booth in the Exhibition Hall where we sold planetary-related gear and held daily meteorite raffles. Staffed by PGD officers throughout the conference poster sessions, the booth constitutes our chief fundraising effort for the year and is the primary means by which our division pays for student travel awards to the annual GSA meeting. Providing exemplary students the means to present their best work at a national conference is a powerful career development tool, and we look forward to continuing to support their endeavors. **Please share with**

us any feedback you might have about the booth!



Exhibition Hall booth at GSA 2016 in Denver.

2016 Award Recipients

2016 Dwornik Award

The judging panel at the 47th LPSC had its hands full with another crop of outstanding entries for the 2016 Dwornik Prize—we received 51 entries for the oral presentations (49 grads, 2 undergrads) and 84 entries for poster presentations (56 grads, 27 undergrads). The PGD officers would like to thank all of our members who attended the 46th LPSC and assisted in judging for the 2016 Dwornik awards. It would simply not be possible to judge the student awards without the help of our volunteers. Please consider judging at LPSC 2017!

The 2016 Dwornik winners are:

Best Graduate Oral Presentation: **Michelle S. Thompson**, University of Arizona, “Simulation of micrometeorite impacts through in situ dynamic heating of lunar soil.”

Honorable Mention, Graduate Oral: **Mathieu G. A. Lapotre**, California Institute of Technology, “Orbital and in-situ

observations in support of the existence of an unknown stable Aeolian bedform regime on Mars.”

Best Graduate Poster: **Cameron M. Mercer**, Arizona State University, “Exploring non-uniform 40Ar^* loss in Apollo 16 impact melt breccias using a laser microprobe.”

Honorable Mention, Graduate Poster: **Lauren M. Jozwiak**, Brown University, “Pyroclastic eruptions on Mercury: Insights into eruption mechanisms from vent morphology.”

Best Undergraduate Oral: **Danielle G. Neighbour**, University of Arkansas, “Cryogenic viscous liquids on icy moons.”

Best Undergraduate Poster: **Julianne Sweeney**, State University of New York at Geneseo, “Crater degradation and surface erosion rates at the InSight landing site, Western Elysium Planitia, Mars.”

Honorable Mention, Undergraduate Poster: **Michael J. O’shea**, State University of New York at Geneseo, “Using the morphology of impact craters as a relative age indicator for fluvial activity at Xanthe Terra, Mars.”

Background: The Dwornik Award was established in 1991 with a generous endowment by Dr. Stephen E. Dwornik, who wished to encourage students who are U.S. citizens to become involved with NASA and planetary science. Applicants for this award must be a U.S. citizen that is currently enrolled as a student at a U.S. or international institution, or a non-U.S. citizen currently enrolled as a student at a U.S. institution. The award consists of a plaque and a \$500 check (graduate) / \$250 check (undergraduate), and is given for those student presentations (poster and oral)

at the annual *Lunar and Planetary Science Conference* (LPSC) hosted by the Lunar and Planetary Institute and NASA Johnson Space Center in Houston, Texas that are judged to be of the highest caliber. The deadline for entry is **Wednesday, January 11, 2017**, which is the day after LPSC abstracts are due. A link to the Dworkin Application can be found here: http://rock.geosociety.org/pgd/Dworkin_application.pdf with more general information about the award here: <http://rock.geosociety.org/pgd/dworkin.html>.

2016 Shoemaker Award

The 2016 Shoemaker Award was presented to **Morgan Cox**, an undergraduate student at *Curtin University (Australia)*. Ms. Cox proposes to collect samples from the Spider impact structure to locate shock-metamorphosed minerals and, in particular, to examine the relationship between shocked zircon and the related phosphate mineral xenotime.

The Eugene M. 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 \$2500, 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.

2016 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 consists of a check for \$500 from the Meteoritical Society and a plaque awarded by the PGD.

The 2016 Pellas-Ryder award was presented to **Tanya Harrison**, *University of Western Ontario*, and **Romy Hanna**, *University of Texas, Austin*, for outstanding publications in a major peer-reviewed journal on topics of significant importance, and for the perseverance to see them published.

Harrison: “Global documentation of gullies with the Mars Reconnaissance Orbiter Context Camera and implications for their formation,” published in *Icarus*, 252, 236-254, 2015.

Hanna: “Impact-induced brittle deformation, porosity loss, and aqueous alteration in the Murchison CM chondrite,” published in *Geochimica et Cosmochimica Acta*, 171, 256-282, 2015.

2016 Ronald Greeley Award for Distinguished Service

Prof. Tracy Gregg, *University of Buffalo*, was awarded the 2016 Ronald Greeley Award for Distinguished Service. Dr. Gregg has dedicated many years of service to the planetary community as a past Chair of the PGD in addition to coordinating PGD members as GSA Fellows. Dr. Gregg is also the Program Director for the NASA Planetary Geology and Geophysics Undergraduate Research Program (PGGURP).



Outgoing PGD chair **Danielle Wyrick** of Southwest Research Institute (left) presenting the Ronald Greeley Award for Distinguished Service award plaque to **Tracy Gregg** (right) of University of Buffalo at the 2016 PGD banquet in Denver.

This award may be given to those members of the PGD, and those outside of the Division and GSA, who have rendered exceptional service to the PGD for a multi-year period.

PGD-Affiliated GSA Fellows

We are pleased to announce that several PGD members were selected as GSA Fellows in 2016.

Dr. Carol A. Raymond, *California Institute of Technology/JPL*. Dr. Raymond was nominated by Prof. Harry Y. McSween for her leadership and management of spacecraft missions exploring planetary geology and her research on Earth's seafloor, Antarctica, and planetary science including planetary magnetic fields and their relationship to crustal structures and tectonics.

Dr. Ellen R. Stofan, *NASA*. Dr. Stofan was nominated by Dr. Louise M. Prockter for her remarkable contributions to science through her research and her leadership. She serves as the NASA Chief Scientist, advising the NASA Administrator and promotes science to lawmakers and the public.

Call for Applications & Nominations

Student Advisory Member: The Planetary Geology Division (PGD) of the Geological Society of America is soliciting nominations for the position of Junior Student Advisor to the PGD. This position is open to all interested graduate and undergraduate students, offering students an opportunity to actively engage with the PGD officers and the planetary community in an important role on this service committee. Responsibilities include participating in regularly scheduled PGD telecons, updating the Student Opportunities page on the PGD website

(<http://rock.geosociety.org/pgd/student-opportunities.html>), helping with the PGD booth during the annual meeting, and serving as the PGD representative to the GSA Student Advisory Council. This is a two-year position (second year as Senior Student Advisor), and includes a partial travel award to attend the annual GSA meeting each year. Interested students should send a current CV (include college major and advisor) and a short justification (~300-500 words) on why they would be interested in serving as Student Advisor.

Please send completed application materials as a single pdf file to PGD 1st Vice-Chair Bradley J. Thomson (bthom@utk.edu) by **June 1, 2017**.

Dwornik Award: This award is now open for U.S. citizens that are currently enrolled

as students at a U.S. or international institution, or non-U.S. citizens currently enrolled as a student at a U.S. institution. The application form to apply for a Dwornik Award is due **January 11, 2017**. More information can be found here:

<http://rock.geosociety.org/pgd/dwornik.html>. Questions regarding the Dwornik awards should be directed to 2nd Vice-Chair Sharon Wilson Purdy (purdys@si.edu).

Due to the advent of the undergraduate awards, the Dwornik fund is no longer self-sustaining. We hope the fund will continue to grow and provide new opportunities, and thus encourage your donations. You can donate

at: <https://www.gsafweb.org/donate/>

In addition, anyone interested in serving as a judge for the Dwornik competition at this year's LPSC please note that there is now a place on your LPSC abstract submission form where you can indicate your willingness. Thanks in advance!

Pellas-Ryder Award: This award, offered jointly with the Meteoritical Society, is an opportunity for student first authors publishing their work in English to receive recognition for outstanding scientific achievement. The deadline for nominations is **January 31, 2017**. See this link for more details:

<http://rock.geosociety.org/pgd/pellas-ryder.html>. To nominate papers published for next year, contact 2nd Vice-Chair Sharon Wilson Purdy (purdys@si.edu).

Ronald Greeley Award for Distinguished Service: All members are encouraged to submit nominations for the Ronald Greeley Award for Distinguished Service. 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 to 1st Vice-Chair Bradley J. Thomson (bthom@utk.edu) prior to **June 30, 2017***. 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 Business Meeting/Awards Reception at the Annual Meeting. *bthom@utk.edu) prior to **June 30, 2017***. 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 Business Meeting/Awards Reception 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 \$2500, 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. *Applications are due early September 2017, 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.

Student Travel Grants: As in recent years, the PGD is offering two travel grants to help defray costs for PGD student members who are traveling to the GSA Annual Meeting to present first-authored papers. Applicants for student travel awards must:

1. Be first author and presenter of a paper that has been submitted to (and accepted for presentation at) the GSA Annual Meeting.
2. Be a Student Member of both GSA and the Planetary Geology Division.
3. Be registered for the meeting before applying for a travel grant.
4. Submit a completed Travel Grant Application, current CV, and a short justification (~300-500 words) for why travel funding is needed.

Checks will be presented at the meeting, following the student's talk or poster. The Application Form and more information is available at:

<http://rock.geosociety.org/pgd/travel-grants.html> Completed application materials should be *submitted as a single PDF file*, due **TBD**, to PGD 2nd Vice-Chair Sharon Wilson Purdy (purdys@si.edu).

Upcoming Meetings & Workshops

Thompson Field Forums: Catastrophic Mega-scale Landslide Failure of Large Volcanic Fields.

The Thompson Field Forums are named in honor of James B. Thompson Jr., a GSA benefactor and professor emeritus at both Harvard and Dartmouth. The next upcoming forum is **September 16-22, 2017** in Cedar City and Bryce Canyon City, Utah. This will be a 6-day field forum designed to investigate the concept of exceptionally large catastrophic collapse of volcanic fields using the distinguishing characteristics and geologic implications of the gigantic Markagunt gravity slide and Marysvale volcanic field, southwest Utah. The application deadline for this Forum is **January 31, 2017**. For more information visit:

http://www.geosociety.org/GSA/fieldexp/Field_Forums.aspx

Membership and Finance

We saw an increase in the number of Planetary Geology division affiliates this year, a testament to our community's wide ranging geologic advances across the solar system. Please remember to renew your membership at GSA annual renewal time and encourage your students and colleagues to join. Division dues are: student, recent

graduate, or K-12 teacher: \$5, Professional member: \$10.

Number of division affiliates	Year
1043	Aug 2016
774	Aug 2015
828	Aug 2014
659	Aug 2013
670	Aug 2012
620	Aug 2011
577	Aug 2010

According to GSA policy, students can join their first division at no cost. Having a vibrant student membership is wonderful and vital for the future, but the immediate trade-off is reduced revenue. Recall that the principal annual expenditure of our division

is our general student travel awards. Help us sustain a strong division by renewing, asking others to join, and volunteering. Thanks for your support!

Financial summary: As of December 31, 2016, PGD has an asset balance of \$16,055. Our revenue was \$4,730 consisting of \$1,797 in division dues, \$2,932 in donations. GSA 2016 Booth sales, our main fundraising mechanism, raised \$1,800. Expenses during this period were \$4,999, including \$1,000 in student awards, \$2,560 in catering for the annual banquet, \$489 for conference service expenses, and \$254 for award plaques. In 2016 our outlays exceeded revenue by \$268.

ANNOUNCING THE 2016 G.K. GILBERT AWARD WINNER

Prof. M. Darby Dyar, Mount Holyoke College



Previous Gilbert Award Recipients: E. Shoemaker (1983); G. Wetherill (1984); W. Alvarez (1985); R. Baldwin (1986); D. Gault (1987); D. Wilhelms (1988); H. Schmitt (1989); H. Masursky (1990); J. Guest (1991); J. Wood (1992); M. Carr (1993); S. R. Taylor (1994); B. Lucchitta, 1995); R. Sharp (1996); R. Greeley (1997); J. Adams (1998); S. Solomon (1999); L. Soderblom (2000); H. J. Melosh (2001); J. Head (2002); R. Phillips (2003), W. Hartmann (2004), L. Wilson (2005), M. Gaffey (2006), M. Zuber (2007), P. Christensen (2008), R. Strom (2009), C. Pieters (2010), S. Squyres (2011), P. Schultz (2012), A. Howard (2013), B. McKinnon (2014), M. P. Golombek (2015).

The 2016 G. K. Gilbert awardee is **Prof. M. Darby Dyar**, Mount Holyoke College.

“Darby gives freely of her time, expertise, and data to anyone who asks. She has created a relentlessly positive, collaborative atmosphere in which all manner of people, from undergraduate to senior scientist, thrive. She has a brain that never stops generating questions and ways to answer them. The perfect illustration of this to me is this past summer, while at Darby’s house for a picnic, Darby was introduced to a friend of a friend, a microbiologist. Darby talked with her for an hour or so. They submitted a proposal together several weeks later! I stand in awe of that ability to look at all kinds of scientific fields and isolate the big issues. Darby is a world-class researcher, teacher, mentor, and friend, and a consummate team player.”
– Excerpt from Citation by Molly McCanta

Dr. Dyar earned a B. A. in Geology and Art History from Wellesley College in 1980 and a Ph.D., in Geochemistry in 1985 from Massachusetts Institute of Technology.

We need your help!

This would be a great time to make a contribution to the Dwornik, Shoemaker, G. K. Gilbert 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://www.gsafweb.org/donate/>) 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:

<i>The Dwornik Fund</i>	amount \$(_____)
<i>The Shoemaker Fund</i>	amount \$(_____)
<i>The G. K. Gilbert Fund</i>	amount \$(_____)
<i>PGD Student Travel Grants</i>	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:
<http://rock.geosociety.org/pgd/>

2016-2017 Division Officers



(Chair) Wray, James J. Research Interests: chemical/ mineralogical composition, morphology, and stratigraphy of solid surface planetary bodies, focusing on Mars and icy satellites of Jupiter and Saturn. Affiliation: School of Earth and Atmospheric Sciences, Georgia Institute of Technology, Atlanta, GA 30332; jwray@gatech.edu



(Past-Chair) Wyrick, Danielle Y. Research Interests: structural geology, tectonic/ volcanic interaction, fluid and gas migration through fractured reservoirs, analog field investigations of Mars. Affiliation: Southwest Research Institute, San Antonio, TX 78247; danielle.wyrick@swri.org



bthom@utk.edu

(1st Vice-Chair) Thomson, Bradley J. Research Interests: Mars surface geology, lunar radar, physical properties measurements, regolith evolution, geologic mapping, Venus shield fields. Affiliation: Dept. of Earth and Planetary Sciences, University of Tennessee, Knoxville, TN 37996;



mlapotre@caltech.edu

(Senior Student Advisory Member) Lapotre, Mathieu G. A. Research Interests: planetary surface processes, fluid mechanics, sediment transport, and spectroscopy. Affiliation: California Institute of Technology, Div. of Geological and Planetary Sciences, Pasadena, CA 91125;



(2nd Vice-Chair) Wilson Purdy, Sharon A. Research Interests: Mars geology, geomorphology, landscape evolution, climate history and geologic mapping. Affiliation: Center for Earth and Planetary Studies, Smithsonian National Air and Space Museum, Washington, DC 20013; purdys@si.edu



(Junior Student Advisory Member) Favaro, Elena. Research Interests: Planetary geomorphology, aeolian processes and mechanics, analogue field investigations, and field work. Affiliation: University of Calgary, Department of Geography, Calgary, AB T2N 1N4; elena.favaro@ucalgary.ca



(Secretary-Treasurer) Martin, Emily S. Research Interests: Icy satellites, tectonics, faults and fractures, geologic mapping. Affiliation: Center for Earth and Planetary Studies, Smithsonian Institution, National Air and Space Museum, Washington, DC 20013; martines@si.edu