NATHALIE A. CABROL

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Professional Summary

Nathalie joined the SETI Institute (SI) in 1998, where she is a Senior Research Scientist. She was named Director of the Carl Sagan Center at the SI in August 2015. In addition to framing the scientific vision at the SI, she leads projects in planetary science and astrobiology, develops science exploration strategies for Mars, Titan, and the Outer Solar System icy moons, and designs robotic field experiments. She explores high altitude lakes in the Andes where environmental conditions are analogous to early Mars. With her team, she documents life's adaptation to extreme environments, the effect of rapid climate change on lake ecosystems and habitats, its geobiological signatures, and relevance to planetary exploration.

Nathalie was the spokesperson for the selection of Gusev crater as the landing site for the Mars Exploration Rover (MER) mission Spirit rover and is a member of the MER science team since 2002. She was the Science PI of the NASA Nomad rover field experiment (1997), and other NASA ASTEP-funded science and technology projects including Life in the Atacama (2003-2006) and Subsurface Life in the Atacama (2011-2015). She is the PI of the NASA ASTEP Planetary Lake Lander project (2011-2015) that explores the impact of ice loss on planetary lakes using technology developed for the exploration of Titan. Since January 2015, she is the PI of the SETI Institute NASA Astrobiology Institute (NAI) team that seeks to understand the impact of rapid environmental change on habitability and biosignature potential on Mars. She counts over 340 peer-reviewed publications and proceedings of professional conferences. She is the author of 3 books, and 7 chapters of books on the subject of planetary science and exploration, astrobiology, and terrestrial extreme environments.

Nathalie's work is featured in the US and international media (e.g., New York Times, TED talk, Discovery Channel, NOVA, M6, BBC, National Geographic, Scientific American, Popular Science, New, New Einsteins, Tested.com, other) and in popular books (e.g., The Martian Race, Gregory Bendford, Warner Books; Almost Human: Making Robots Think, Lee Gutkind, Norton & Company, Inc; Are We Alone? Gloria Skurzynski, National Geographic Society; Mapping Mars: Science, Imagination, and the Birth of a World, Macmillan).

Nathalie is the recipient of NASA and other research awards. She was elected Carey Fellow in 2007, Women of Discovery (Air and Space) Wings Worldquest (2005), and received an International Women Leadership Association Award in 2012. Education and Public Outreach (E/PO) has a central place in her work. She mentors students in the field and in the lab., and meets with them in schools. All of her projects involve a large E/PO component. To date, she has given over 400 public lectures on the subjects of planetary science, exploration, and astrobiology.

Skills

Leadership
Vision / Innovation
Creativity
Structure / Organization

Languages

French (native)
English (professional proficiency)
Italian (bilingual proficiency)
Spanish: (minimum prof. proficiency)
Classical: Latin (5 years)/Greek (1 year)

Impact Factor

Scholar Impact Factor: h-index: 37; i-10: 77; RGScore: 44.89, Impact Factors: 790:54 (Higher than 97.5% of listed members)

Work History

• Director, Carl Sagan Center	SETI Institute	Since Aug. 8, 2015
• Principal Investigator	SETI Institute / NASA Ames	Sep. 1998 – Present
• National Research Council Fellow	NASA Ames	Jun. 1996 – Jun. 1998
• MESR (France) Postdoc. Fellow	NASA Ames	Nov. 1994 – May. 1996
• Act. Hydro. Postdoc. Fellow, France	Observatoire de Paris/ Meudon	Mar. 1992 – Oct. 1994

Education

• Geology Lecturer Certification	Versailles Academy, France	Jun 1995
• **PhD**: *Evolution of Water on Mars*	Univ. Paris I, Sorbonne	Dec. 1991
• **DEA**, Dynamic Geomorphology	Univ. Paris I, Sorbonne	Jun. 1987
• **Master**, *Ma'adim and Dao Valles, Mars*	Univ. Paris I, Sorbonne	Jun. 1986
• **Undergraduate Degrees -** *Major:* Earth Science – Climate, Hydrology, Geomorphology, Environmental Hazards, Remote Sensing, Mapping. *Minors:* History, Philosophy, Statistics.	Univ. Paris 10, Nanterre	June 1985
• **Hypokhâgne**: Classical Studies.	Lycée Debussy, France	Jun 1983

Professional Experience

- **August 2015-Present:** Director, Carl Sagan Center, SETI Institute.
- **2014-2019:** Principal Investigator (PI), SETI Institute NAI Team: *Changing Planetary Environments and the Fingerprints of Life*.
- **2011-2015**:PI, NASA ASTEP: Planetary Lake Lander.
- **2011-2015:** Science PI, NASA ASTEP: Subsurface Life in the Atacama Project.
- **2011-2013:** Co-Investigator (Co-I) ASTID: TextureCam: Onboard Image Texture Analysis.
- **2008-2011:** PI, NASA Exobiology Program: Thermal detection of caves on Earth and Mars.
- **2007-2010:** PI, NASA E/PO Supplement to PGG - Young Women in Science.
- **2007-2010:** PI, NASA PGG: Formation and Evolution of Spherules and Possible Planetary Analogy
- **2007-2010:** PI, NASA MDAP: Systematic Sedimentology of Rocks and Soils at Gusev Crater
- **2003-Present**: Participating Scientist, NASA Mars Exploration Rover mission; Science Team.
- **2003-2008:** PI "Impact of UV on life in some of the highest lakes on Earth", NAI/Co-I SETI team.
- **2003-2007:** Co-I, NASA-AIRS: Analyzing science operations for the robotic search for life in the Atacama.
- **2003-2006**:Science PI, NASA ASTEP: Life in the Atacama project: Searching for life with rovers.
- **2003-2006:** Co-I, NASA ASTEP Grant: *Science-on-the-fly* (autonomous science with rovers).
- **2003:** Expedition Lead, National Geographic Society expedition grant, High Lakes, Andes.
- **2002-2005:** Co-I, NASA AISR Grant: Data-Centric Analysis of human-directed robotic geology.
- **2002-2003**:PI, NASA ARC-DDF Grant: Exploring the limits of life in some of the highest lakes on Earth.
- **2001-2003:** Science Lead, NASA ARC-IS: Autonomous exploration of aqueous environments on Mars.
- **2000-2003:** Spokesperson for the selection of Gusev crater as the landing site for the Spirit rover.

- **1999:** Science Lead and Project Manager of the first astronaut-rover field experiment (ASRO) in Silver Lake. Project in collaboration with NASA Johnson Space Center.
- **1999:** Deputy-Science Lead, Marsokhod rover field experiment, Silver Lake.
- **1997:** Science Lead, Nomad rover field experiment, Atacama desert, Chile.
- **1995-1996:** Science team member: Marsokhod rover field experiment, Tuba City and Hawaii.
- **1994-1995:** Science Lead on a study of the feasibility of an astrobiology mission on Mars (NASA Ames).

Professional Committees and Reviews

Chair, Biosignature Detection Working Group at the NASA Astrobiology Institute.

Member of the OPAG "Roadmap to Ocean Worlds (ROW)" Group to identify and prioritize science objectives for ocean worlds, design a roadmap to explore these worlds and address science objectives, recommend technology, mission concepts in support of the decadal survey, and place exploration of ocean worlds into the larger context of solar system exploration since February 2016.

Member of the MEPAG Science Analysis Group (SAG) "Scientific Objectives for the Human Exploration of Mars" (HSO-SAG), since March 2015.

Executive Council member, NASA Astrobiology Institute, since November 2014.

Co-Chair, Study Steering Group on "Deglaciation: Past, Present, Future" jointly commissioned and supported by the NASA Cryosphere Program and the Astrobiology Program (2011-2013).

External Reviewer for : NASA Mars Fundamental Research Program (MFRP), NASA Mars Data Analysis Program (MDAP), NASA Planetary Geology and Geophysics (PG&G), NASA Planetary Instrument Definition & Development Program (PIDDP), NASA Moon Mars Analog Mission Activities, External advisor for the European Space Agency (ESA) Exobiology Science Team Study, External Collaborator, ESA Reports for the Search for Life in the Solar System (final report June 1997).

Internal Reviewer for: NASA PSTAR program.

Member: International Academy of Astronautics SETI Permanent Committee

Committees and Reviews for Professional Journals

Reviewer for Meteoritics and Planetary Sciences, Nature, Cambridge University Press (science books), Geophysical Research Letter, Icarus, Journal of Geophysical Research, Planetary & Space Science,

Editorial Board of Professional Journals

Astrobiology Journal, (Sherry L. Cady Editor in Chief), (2012-Present).

Board of Editors of the European International Journal of Astrobiology (2001-2009).

Professional Awards

Science:

- **NASA Group Achievement Award** – Planetary Lake Lander Project Team, (2014).
- **NASA Group Achievement Award** – Mars Exploration Rover Science and Operations Team. Citation: For ten years of sustained exploration and scientific discovery on the surface of Mars with the Mars Exploration Rovers (2014).
- **NASA Group Achievement Award** – ARC Family 2013 (2014).
- American Institute of Aeronautics and Astronautics **Haley Space Flight Award** for the Mars Exploration Rover Development and Operations Team (2012).
- **New zooplankton species** from the Licancabur summit lake (5,914 m asl) named after Cabrol: *Scutiglypha* cabrolae (2009)
- **NASA Group Achievement Award** for the MER 3rd and 4th extended mission (2008).
- **NASA Ames Honor Award** for Excellence as Contractor Employee (2005).
- **NASA Group Achievement Award** : MER extended mission Science/Science Support Team (2005).
- **NASA Group Achievement Award** for the MER Science Support Team (2004).
- **NASA Group Achievement Award** for the MER Science Operations Team (2004).
- Earth and Space Foundation **First Exploration Award** to the Mars Exploration Rover Team (2004).

- **Gold Medal**, International Water and Science Award (Unesco/European Parliament) (2000).
- NASA Ames Research Center Space Science Division **Outstanding Achievements Award** (1999).
- **NASA-JSC Group Achievement Award** for the Astronaut/Rover (ASRO) Project (1999).
- **NASA Ames-IMG Outstanding Achievement Award** for the ASRO Field Experiment (1999).
- Medal of the French Société d'Encouragement au Progrès for Scientific Research (1997).
- Medal of the Observatory of Triel (France) for PhD thesis research (1992).

Women Leadership:

- International Women Leadership Association Award (2012).
- Wings WorldQuest Elected Carey Fellow (2007)
- Women of Discovery: Air and Space Award, Wings WorldQuest, (2005)

Recent Honors (2005 - Present):

- New York Times Article (Magazine, March 25, 2018).
- Sagan Lecture, invited speaker, AGU Fall Conference, San Francisco, December 14, 2016.
- TED Conference 2015, invited speaker, Vancouver (2015).
- Keynote Speaker (2013) – First Astrobiology Conference, Universidad Andres Bello, Santiago (Chile) October 8-12, 2013: Lecture title: *Pathways to Planetary Exploration.*
- Keynote Speaker, (2013) – Conferencia International, Santiago (Chile), April 2013: Lecture title: *From the Andes to Kepler – A Decade of Revolution in the Search for Life Beyond Earth.*
- Session Chair, AGU Fall session (2012): Rapid Environmental Change and the Fate of Planetary Habitability (I, II, III).
- Invited speaker, AGU Fall session (2010)
- Invited speaker, 32nd, Microbiology Symposium, Antofagasta, Chile (2010).
- Session Chair and Invited speaker, SPIE Conference (2010): Instruments, Methods, and Mission for Astrobiology Session.
- Invited speaker, SPIE Conference, San Diego (2007).
- Science Organizing Committee, 41st Lunar and Planetary Science Conference.
- Science Panel, NASA Summer University, NASA Ames (2009).
- Invited speaker, NASA Ames Director's Colloquium Series (2007).
- Invited speaker, NASA Risk and Exploration Symposium, Monterey, CA (2005).
- Invited speaker (Colloquium Series), NASA Goddard Flight Center (2005).

Education and Public Outreach

Sharing the excitement of exploration and discovery in planetary exploration is paramount in Cabrol's career. She started giving public lectures at age 23. She now counts over 400 lectures in the USA, France, Chile, and Mexico, including a broad range of audiences, e.g., the general public, private industries, associations, societies and clubs, museums and exploratoriums, schools, colleges, universities, and retirement homes. She also trains the next generation of explorers and scientists by involving them in scientific expeditions in the desert, in the Andes, and in planetary research at NASA Ames and the SETI Institute through programs that include: the NASA Astrobiology Academy Student Program, NASA Ames GSRP, REU, NASA Biology Program Internship, and NASA Postdoctoral Program.

Membership in Professional Societies and Other

- Astrobiology Society
- American Geophysical Union
- TED
- Wings WorldQuest
- Trustee, National Parks Conservancy
- Sempervirens Fund (Protection of Redwood Forests)
- International High IQ Society

Current Certification

- Scientific O2 Rebreather (Aqualung C.O.D.E)

- WASI/NASE Worldwide Open Water Scuba Diver
- California Department of Boating and Waterways License
- First Aid (American Health Care Academy)
- Adult/Child/Infant CPR/AED (American Health Care Academy)

Other

- Born August 30, 1963, Bagneux (France); Married to Edmond A. Grin in April 15, 2000 (Los Gatos, California, USA); No children. US citizen.
- Hobbies: Diving, kayaking, mountaineering, trekking, music, art and symbolism, writing, reading.
- Co-Exec Producer, *In Saturn's Rings* IMAX movie (coming up in 2015), Stephen van Vuuren, Director.
- Two women world records for high altitude free diving and scuba diving (Licancabur, 5,914 m).
- **Websites:** www.seti.org/users/nathalie-cabrol; www.researchgate.net/profile/Nathalie_Cabrol; www.linkedin.com/profile/view?id=48233;
- Founder and Administrator of Planetary Landscapes (>322,000 followers to date): www.facebook.com/PlanetaryLandscapes?ref=boo

Publications

I. Peer-Reviewed Journals (listed by year)

Cabrol, N. A. , The co-evolution of life & environment on Mars: An ecosystem perspective to the robotic search of biosignatures, *Astrobiology*, 18(1): 10.1089/ast.2017.1756, 2018.

Echeverría-Vega, A., C. S. Demergasso, G. Chong, A. E. Serrano, M. Guajardo, O. Encalada, V. Parro, Y. Blanco, Luis Rivas, M. Moreno-Paz, J. Luque, K. C. Rose, **N. A. Cabrol**, Watershed-induced limnological and microbial status in two oligotrophic Andean lakes exposed to the same climatic scenario, Frontiers in Microbiology, section Aquatic Microbiology, 296225.

Cabrol, N. A., Alien mindscapes – Perspective on the Search for Extraterrestrial Intelligence. *Astrobiology*, **16**, 9, DOI: 10.1089/ast.2016.1536, 2016

Cabrol, N. A., *What Are We Looking For? An Overview of the Search for Extraterrestrials*, In: Aliens, Al-Khalili,, J., ed., Chapter 16, pp 178-187, 2016.

Etcherverria, A., et al. Discrepancies in microbial and limnological response to climate change of close-related Andean oligotrophic lakes triggered by watershed characteristics. *Geobiology*, 2017 (submitted).

Vijayarangan, S., D. Kohanbash, G. Foil, D. Thompson, A. Wang, K. Zacny, N. Cabrol, and D. Wettergreen, Robotic subsurface exploration and science with long duration autonomy, 2017.

Parro, V., Y. Blanco, F. Puente-Sánchez, L. A. Rivas, M. Moreno-Paz, A. Echeverria, G. Chong-Diaz, C. Demergasso, and **N. A. Cabrol**, Biomarkers and metabolic patterns in the sediments of evolving glacial lakes as a proxy for planetary lake exploration. *Astrobiology*, V. 17., doi: 10.1089/ast.2015.1342.

Overholt, P., K. C. Rose; C. E. Williamson; J. M. Fischer; **N. A. Cabrol**, Behavioral responses of freshwater calanoid copepods to the presence of ultraviolet radiation: avoidance and attraction, Journal of Plankton Research; doi: 10.1093/plankt/fbv113, 2016.

Feister, U., **N. Cabrol**, and D. Häder, UV irradiance enhancements by scattering of solar radiation from clouds, *Atmosphere*, **6**, 1211-1228, doi: 10.3390/atmos6081211, 2015.

Wei, Jei., A. Wang, J. L. Lambert, D. Wettergreen, **N. A. Cabrol**, K. Warren-Rhodes, and K. Zacny, Autonomous soil analysis by the Mars Micro-beam Raman Spectrometer (MMRS) onboard a rover in the Atacama: A Terrestrial analog test for planetary exploration, *J. Raman Spect.,* DOI 10.1002/jrs.4656, 2015.

Cabrol, N. A., E. A. Grin, V. Parro, K. C. Rose, J. E. Moersch, T. M. Smith, . Y. Lee, L. Pedersen, D. S. Wettergreen. Lorenz, L. Prufert-Bebout, A. Detweiler, C. Demergasso, A. Echeverria, E. D. Smith, T. Fong, C. Tambley, ThePlanetary Lake Lander Project: Taking steps towards the exploration of Titan's seas and lakes, *Astrobiology PLL special issue* (2015, in prep.).

Lorenz, R. D., and **N. A. Cabrol**, On-board science insights and vehicle dynamics from scale-model trials of the Titan Mare Explorer (TiME) capsule at Laguna Negra, Chile, *Astrobiology PLL special issue*, doi:10.1089/ast.2015.1303, 2016.

Cabrol, N. A., K. Herkenhoff, A. H. Knoll, J. D. Farmer, R. Arvidson, E. A. Grin, R. Li, L. Fenton, B. Cohen, J. F. Bell III, and R. A. Yingst, Sands at Gusev crater, Mars, *J. Geophys. Res., Special Issue*, Mars Exploration Rover Mission, 10.1002/2013JE004535, 2014.

Cabrol, N. A., U. Feister, E. D.-P. Häder, H. Piazena, A. Grin, and A. Klein, Record Solar UV Irradiance in the Tropical Andes, *Frontiers in Environmental Sciences*, 2, doi: 10.3389/fenvs.2014.00019, 2014.

Bekker D. L., W. J. Abbey, **N. A. Cabrol**, K. S. Manatt, K. F. Ortega, D. R. Thompson, and K. L. Wagstaff, A field demonstration of a smart instrument performing autonomous classification of geologic surface, *Astrobiology*, 14, 6, 1-16, 2014.

Pedersen L., T. Smith, S. Y. Lee, and **N. Cabrol**, Planetary Lake Lander – A robotic sentinel to monitor remote lakes, *. J. Field Robotics*, doi: 10.1002/rob.21545.

Rose, K. C. D. P. Hamilton, C. E. Williamson, C. G. McBride, J. M. Fischer, M. H. Olson, J. E. Saros, M. G. Allan, **N. A. Cabrol**, Light attenuation characteristics of glacially-fed lakes *JGR-Biogeosciences*, 119: 8, 1446–1457, 2014.

Sobron, P., C. Lefebvre, R. Leveille, A. Koujelev, T. Haltigin, H. Du, A. Wang, **N. A. Cabrol**, K. Zacny, J. Craft, and the LiTA 2012 Team, Geochemical profile of a layered outcrop in the Atacama analogue using laser-induced breakdown spectroscopy; Implications for Curiosity investigations in Gale, *Geophys. Res. Lett.*, 40, 10, 1965-1970, 2013.

Wagstaff, L. L., D. R. Thompson, W. Abbey, A. All wood, D. L. Bekker, **N. A. Cabrol**, T. Fuchs, and K. Ortega, Smart, texture-sensitive instrument classification for in situ rock and layer analysis, *Geophysical Research Letters*, vol. 40, 2013.

Zacny, K., G. Paulsen, C. P. McKay, B. Glass, A. Davé, A. F. Davila, M. Marinova, B. Mellerowiczm J. Heldmann, C. Stoker, **N. A. Cabrol**, M. Hedlund, and J. Craft, Reaching 1 m deep on Mars: The Icebreaker drill, *Astrobiology*, 13, 12, 2013.

Pedersen, L., T. Smith, S. Lee, **N. A. Cabrol**, and K. Rose, Planetary Lake Lander – A Robotic Sentinel to Monitor a Remote Lake, *J. Field Robotics*., 2012.

Arvidson, R.E., S. Ruff, R.V. Morris, R. Gellert, D.W. Ming, L. Crumpler, A. Yen, S.W. Squyres, M. Rice, J.F. Bell III, **N.A. Cabrol**, W. Farrand, A. Shaw, K. Siebach, R. Greenberger, J.A. Grant, E.A. Guinness, K.E. Herkenhoff, J.R. Johnson, G. Klingelhöfer, R. Li. Spirit Mars rover mission to the Columbia Hills, Gusev crater: Mission overview and selected results from the Northern Home Plate Winter Haven to the side of the Scamander crater. *J. Geophys. Res.-Planets*, MER Special Issue, 2010.

Cabrol, N. A., and E. A. Grin, Searching for lakes on Mars: Forty years of exploration, In: *Lakes on Mars* (Cabrol, N. A. and E. A. Grin, Eds), Chapter 1, Elsevier, 1-31, (2010).

Cabrol, N. A, E. A. Grin, G. Chong, A. N. Hock, D. P. Häder, et al., Declining lake habitat in rapid climate change, In: *Lakes on Mars* (Cabrol, N. A. and E. A. Grin, Eds), Chapter 13, 347-369, Elsevier.

Cabrol N. A., D. T. Andersen, C. R. Stoker, P. Lee, C. P. McKay, and D. S. Wettergreen. Chapter 10: Other Analogs to Mars: High altitude, subsurface, desert, and polar environments. In: *Life in Antarctic Deserts and other Cold Dry Environments: Astrobiological Analogues*, Peter T. Doran, W. Berry Lyons, and Diane M. McKinght, (Eds.), Cambridge University Press, Cambridge Astrobiology, NY, 258-305, 2010.

Crumpler, L. S., R. E. Arvidson, S. W. Squyres, D. Blaney, J.F. Bell III, **N. A. Cabrol**, B. Cohen, D. DesMarais, et al., Field reconnaissance geologic mapping of the Columbia Hills, Gusev crater based on MER Spirit rover and MRO HiRISE observation. *J. Geophys. Res.-Planets* MER Special Issue, 2010.

Demergasso, C., C. Dorador, D. Meneses, J. Blamey, **N. A. Cabrol**, L. Escudero, and G. Chong. Prokaryotic diversity pattern in high-altitude ecosystems of the Chilean Altiplano. *J. Geophys. Res*., 115, G00D09, doi:10.1029/2008JG000836, 2010.

Cabrol, N. A., and the HLP team. The High Lakes Project. *J. Geophys. Res.-Biogeosciences*, High Lakes Project, special issue, doi:10.1029/2008JG000818, 2009.

Dorador, C., D. Meneses, L. Escudero, J. Blamey, **N. A. Cabrol**, G. Chong, and C. Demergasso. Microbial communities in Salar de Aguas Calientes and Laguna Lejía, two high altitude lakes of the Chilean Altiplano. *J. Geophys. Res.-Biogeosciences*, HLP Special Issue, 2009.

Arvidson, R., S. Ruff, R.Morris, D. Ming, L. Crumpler, A. Yen, S. Squyres, R.J. Sullivan, J.F. Bell III, **N.A. Cabrol** et al., 2008. Spirit Mars rover mission to the Columbia Hills, Gusev crater: Mission Overview and selected results from the Cumberland Ridge to Home Plate. *J. Geophys. Res.-Planets*, 111, E12S08, 2008.

Cabrol, N. A., K. Herkenhoff, R. Greeley, E. A. Grin, C. Schröder, C. d'Uston, C. Weitz, et al., Soil sedimentology at Gusev crater from the Columbia Memorial Station to Winter Haven, *J. Geophys. Res*. 113, E06S05, MER Special Issue, 2008.

Chen, B., **N. A. Cabrol**, C. P. McKay, C. Shi, C. Gu, R. Newhouse, J. Zhang, T. Lam, Q. Pei, Mix and Match: Enhanced Raman spectroscopy instrumentation in field applications. *SPIE Conference, Invited Communication, Proceedings*, 2008.

Greeley, R., P. L. Whelley, L. D. V. Neakrase, R. E. Arvidson, N. T. Bridges, **N. A. Cabrol**, et al., Mars: Aeolian features see from the ground and orbit. *J. Geophys. Res*. MER Special Issue, Res., 113, E06S06, doi: 10.1029/2007JE002971, 2008.

Schmidt, M. E., S. W. Ruff, T. McCoy, W. H. Farrand, J. R. Johnson, R. Gellert, D. W. Ming, R. V. Morris, **N. A. Cabrol** et al., The hydrothermal origin of halogens at Home Plate, Gusev crater. *J. Geophys. Res*. 113, E06S05, MER Special Issue, 111, No. E2, E02S10, 10.1029/2005JE002480, 2008.

Weinstein, S., D. Pane, L. A. Ernst, K. Warren-Rhodes, J. M. Dohm, A. N. Hock, J. L. Piatek, S. Emani, F. Lanni, M. Wagner, G. W. Fisher, E. Minkley, L. E. Dansey, T. Smith, E. A. Grin, K. Stubbs, G. Thomas, C. S. Cockell, L. Marinangeli, G. G. Ori, S. Heys, J. P. Teza, J. E. Moersch, P. Coppin, G. C. Diaz, D. S. Wettergreen, **N. A. Cabrol**, and A. S. Waggoner, Application of pulsed-excitation fluorescence imager for daylight detection of sparse life in tests in the Atacama Desert, *J. Geophys. Res*., 113, G01S90, doi:10.1029/2006JG000319, 2008.

Yingst, R. A., L. Crumpler, W. H. Farrand, R. Li, **N. A. Cabrol**, and L. D. Neakrase, Morphology and texture of particles along the Spirit rover traverse from sol 450 to sol 745, *J. Geophys. Res*., 113, E12S41, doi:10.1029/2008JE003179, 2008.

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Cabrol, N. A., E. A. Grin, and A. N. Hock, Mitigation of environmental extremes as a possible indicator of extended habitat sustainability for lakes on early Mars. *Proc. SPIE Conf.,* 6694-36, 1, San Diego, 2007.

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Greeley, R., P. L. Whelley, L. D. V. Neakrase, R. E. Arvidson, N. T. Bridges, **N. A. Cabrol,** et al., Columbia Hills, Mars: Aeolian features see from the ground and orbit. *J. Geophys. Res*. MER Special Issue, Res., 113, E06S06, doi: 10.1029/2007JE002971, 2007.

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Mahaney, W., H. Miyamoto, J. Dohm, V. Baker, **N. A. Cabrol**, E. Grin, and D. Berman, Rock glaciers on Mars: Earth-based clues to Mars' recent paleoclimatic history. *Planetary & Space Sciences,* 55, 181-192, 2007.

Morris, R. L., R. Berthold, and **N. A. Cabrol**, Diving at extreme altitude: Dive planning and execution during the 2006 High-Lakes science expedition, *Proc. AAUS Conference*, 2007.

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