

PERSONAL INFORMATION**Patricio Becerra, Ph.D**

Date of birth: 05.07.1985

Nationality: Peruvian (Swiss Temporary Residence Permit B)

Space Research and Planetary Sciences

Physikalisches Institut, Universität Bern

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E-mail: patriciobecerrav@gmail.comURL: <http://www.pbecerra.com/>LinkedIn: [linkedin.com/in/patriciobecerra/](https://www.linkedin.com/in/patriciobecerra/)**PROFILE**

Planetary scientist specialised in research based on the acquisition, processing and analysis of remote sensing and laboratory data, with a particular focus on planetary surface processes. Experience within NASA and ESA planetary exploration missions, taking on leading roles involving scientific data analysis, mission concept design, and operations. Project management experience in industry and academia, in particular through the organisation of international scientific conferences. I enjoy working in diverse team environments where ideas are constantly developed. My career goal is to combine my scientific and managerial skills to take on leadership positions within planetary and space science, in order to define the future objectives and priorities of the field.

EDUCATION

11.2011 – 08.2016	University of Arizona , Tucson, AZ, USA <i>Doctor of Philosophy [PhD], Planetary Sciences (Minor in Geosciences)</i> Thesis: "The Poles of Mars, Past and Present: A high-resolution observational study of the Martian Polar Regions and their connection to climate"
12.2012 – 12.2013	<i>Graduate Certificate in Engineering Management</i>
09.2009 – 11.2011	<i>Master of Science [MSc], Planetary Sciences</i>
03.2002 – 12.2007	Pontificia Universidad Católica del Perú , Lima, Peru <i>Bachelor of Science [BSc], Physics</i>

PROFESSIONAL EXPERIENCE

01.2021 – Present	Micro-Cameras and Space Exploration SA , Neuchâtel, Switzerland (NCCR PlanetS Technology Platform Knowledge Transfer grant) <i>Project Manager: ESA JUPITER ICy moons Explorer (JUICE) Monitoring Camera Colour Chart (JMC CC)</i> - Management of the design, construction, qualification and delivery of a colour calibration target for JMC (project under extremely tight schedule) <i>Project Scientist: NASA Volatiles Investigating Polar Exploration Rover (VIPER) Imaging System (VIS); Monitoring Camera v3 (MCAMv3)</i> - Verification of radiometric calibration requirements
02.2017 – Present	Physikalisches Institut, Universität Bern , Bern, Switzerland <i>Postdoctoral Researcher in Space Research and Planetary Sciences</i> - Led multidisciplinary research projects in collaboration with senior scientists and students, both locally and internationally - Made and published scientifically relevant discoveries through: o Acquisition, manipulation and analysis of remote sensing data (images, spectra, topography, radar) of the Martian surface o Simulations and modelling to interpret remote sensing data o Design and execution of laboratory experiments: Electrical properties of soil samples to simulate the surfaces of Mars and Comets - Co-organized the 7th International Conference on Mars Polar Science and Exploration (2 weeks, 100 people). Brought conference to South America for the first time in its history.

08.2016 – 01.2017	Department of Planetary Sciences, University of Arizona, Tucson, AZ, USA <i>Research Specialist</i> - Specialised in pattern detection in images of the Mars north polar ice cap
09.2009 – 07.2016	<i>Graduate Research Associate</i> - Designed, led and successfully completed a multi-year, NASA-funded PhD project focused on studying the Martian polar ice sheets - Specialised in data processing and analysis of satellite images, hyperspectral images, and 3D products (digital elevation models) - Created a novel data extraction method based on Fourier/Wavelet analysis and signal matching of geophysical data - Constructed a model of spectral reflectance to simulate data from satellite cameras and spectrometers (model is still in frequent use)
03.2007 – 05.2009	National Commission for Aerospace Research and Development (CONIDA) – Peruvian Space Agency, Lima, Peru <i>Research Assistant: Astronomy Department</i> - Created and led a planetary astronomy research group - Organized a week-long Short Course on Planetology for 70 people - Successfully evaluated and reported on the sky conditions of a site selected for the construction of an observatory in Moquegua, Peru, through acquisition and processing of telescope images (Established a working relationship with agricultural communities around the observatory site, contributing to their education and development)

SPACECRAFT MISSION EXPERIENCE

09.2017 – Present	Colour and Stereo Surface Imaging System (CaSSIS) – Stereo camera onboard ESA ExoMars Trace Gas Orbiter <i>Science Theme Deputy Lead for Ice and Periglacial Processes</i> - Managed several successful data acquisition campaigns - Selected, planned and reviewed scientifically relevant goals and data - Tested and validated image compression algorithms
08.2016 – Present	High Resolution Imaging Science Experiment (HiRISE) – Ultra high-resolution camera onboard NASA Mars Reconnaissance Orbiter <i>Science Theme Lead for Climate Change</i> - Prioritize image acquisition objectives related to climate change theme
09.2018 – 02.2020	2019 NASA Discovery Program Mission Proposal: Climate Orbiter for Mars Polar Atmospheric and Subsurface Science (COMPASS) <i>Co-Investigator: Dual-Mode Radar (Sounder and SAR) Instrument</i> - Member of a multi-national team of scientists that designed and proposed a mission to the NASA Discovery program (cost cap: USD 500 Million) - Co-designed measurement objectives for the radar instrument in order to meet the scientific goals of the mission
08.2014	NASA Planetary Science Summer School: Argus (Io flyby mission) <i>Risk and Programmatics Chair/Imaging camera Principal Investigator</i> - Member of a multidisciplinary team of scientists and engineers tasked with designing a viable NASA mission proposal in two weeks - Analysed risk and designed mitigation strategies of the mission - Devised measurement goals and required technical specifications of the camera instrument

APPROVED GRANTS

04.2021 – 06.2021	JUICE Monitoring Camera Simulator. NCCR PlanetS Technology Platform. “Knowledge Transfer with a Short-Term Project” <i>Principal Investigator</i>
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| 04.2018 – 03.2020 | Investigation of the solar system using remote sensing and laboratory techniques. Swiss National Science Foundation grant 200020_178847
<i>Contributor</i> |
| 09.2016 – 08.2020 | Ice Deposits in Polar Craters on Mars. NASA Mars Data Analysis Program grant number 80NSSC17K0510. NASA, USA
<i>Contributor</i> |
| 09.2013 – 08.2016 | Wavelet Analysis of Martian Polar Stratigraphy from HiRISE Topography. NASA Earth and Space Science Fellowship grant NNX13AO55H. NASA, USA
<i>Principal Investigator</i> |

FELLOWSHIPS, AWARDS, HONOURS

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| 04.2019 | Geosciences Journal Travel Award |
| 04.2019 | Universität Bern Young Academics Support Award |
| 04.2014 | University of Arizona College of Science Galileo Circle Scholar |
| 02.2014 | Lunar and Planetary Institute Career Development Award |
| 05.2013 | NASA Earth and Space Science Fellowship |
| 04.2013 | Lunar and Planetary Laboratory Graduate Teaching Excellence Award |

SUPERVISION OF JUNIOR RESEARCHERS

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| 09.2018 – Present | Physikalisches Institut, Universität Bern, Bern, Switzerland
<i>Adomas Valantinas. Ph.D. student.</i> Remote Sensing Analysis of Slope Streaks in Arabia Terra, Mars. Official supervisor: Prof. Nicolas Thomas |
| 08.2020 – 02.2021 | <i>Lukas Affolter. M.Sc. student.</i> Dielectric and photometric properties of Martian simulant soils. Co-supervised with Dr. Antoine Pommerol. |
| 01.2020 – Present | Brown University, Providence, RI, USA
<i>Alyssa Pascuzzo. Ph.D. student.</i> Remote advisor and collaborator on: Hyperspectral assessment of the layering mechanisms of the North Polar Layered Deposits of Mars. Thesis advisor: Prof. Jack Mustard |
| 01.2020 – Present | Georgia Institute of Technology, Atlanta, GA, USA
<i>Sergio Parra. B.Sc. Student.</i> Georgia Institute of Technology (Now a Ph.D. student at the California Institute of Technology). Surface texture of the North Polar Ice Cap of Mars. Institutional supervisor: Dr. Sarah M. Milkovich (JPL) |

TEACHING

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| 09.2017 – 12.2020 | Physikalisches Institut, Universität Bern, Bern, Switzerland
<i>Teaching Assistant in:</i> Laborkurs Moderne Physik II (40 ECTS), Physikpraktikum für Minor Physik und Pharmazie (2 ECTS), Physik Praktikum Studierende Biologie (2 ECTS).
Instructors: Prof. Ingo Leya, Prof. Michele Weber, Prof. Saverio Braccini |
| 09.2015 – 12.2015 | Department of Planetary Sciences, University of Arizona, Tucson, AZ, USA
<i>Guest lecturer in:</i> PTYS554 Evolution of Planetary Surfaces (Postgraduate level course. ~6 ECTS) |
| 02.2012 – 12.2012 | <i>Teaching Assistant in:</i> PTYS214 Astrobiology (~6 ECTS), PTYS170B1 The Universe and Humanity (~6 ECTS) |

INSTITUTIONAL RESPONSIBILITIES

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| 02.2017 – 12.2020 | Physikalisches Institut, Universität Bern, Bern, Switzerland
Centre for Space Research & Planetary Sciences (WP), Universität Bern, Seminar Series: <i>Committee Member</i> |
| 03.2014 – 03.2015 | Department of Planetary Sciences, University of Arizona, Tucson, AZ, USA
Lunar and Planetary Laboratory “Mission Work” Seminar Series: <i>Co-organiser</i> |
| 08.2010 – 08.2012 | Lunar and Planetary Laboratory Conference: <i>Co-organizer</i> |

INVOLVEMENT IN CONFERENCES AND WORKSHOPS

01.2020	7th International Conference on Mars Polar Science and Exploration , Ushuaia, Argentina <i>Co-Lead Organizer and Convener, Session Chair, Lead Synthesizer</i>
07.2019	Ninth International Conference on Mars , Pasadena, CA, USA <i>Session Chair</i>
08.2017 – 11.2017	Keck Institute for Space Science Workshop “Unlocking the Climate Record Stored within Mars' Polar Layered Deposits I and II” <i>Invited lecturer and workshop participant</i>
03.2017, 03.2018 03.2016	Lunar and Planetary Science Conference , The Woodlands, TX, USA <i>GSA Dwornik Award judge</i> <i>Session chair</i>
09.2016	6th International Conference on Mars Polar Science and Exploration , Reykjavik, Iceland <i>Session chair</i>
11.2008	CONIDA First Short Course on Planetology , Lima, Peru <i>Lead organizer and convener</i>

SCIENTIFIC REVIEW

2017 – Present	NASA ROSES Planetary Science Research Program <i>Panelist and/or External Reviewer for Research and Analysis proposals to: Mars Data Analysis Program (MDAP), Cassini Data Analysis Program (CDAP), New Frontiers Data Analysis Program (NFDAP), NASA Earth and Space Science Fellowship (NESSF)</i>
2015 – Present	<i>Referee for: Icarus (2017 certificate for outstanding contribution in reviewing), Planetary and Space Science, Science Advances, Monthly Notices of the Royal Astronomical Society, Journal of Geophysical Research – Planets</i>
2016	NASA ROSES Planetary Science Research Program <i>Executive Secretary for Instrument Development proposals to Planetary Instrument Concepts for the Advancement of Solar System Observations (PICASSO)</i>

INVITED PRESENTATIONS

02.2021	<i>Why fly a drone to Mars' north pole?</i> – Invited expert scientist presentation to NASA/JPL program managers on the best possible scientific motivation for a UAV mission to the Martian poles.
10.2020	<i>Radar investigations of ice bodies on Mars</i> – Seminar on Microwave Physics and Atmospheric Physics. Physics Institute, University of Bern.
09.2020	<i>Los hielos polares de Marte y su registro climático</i> – Coloquios de Física. Departamento Académico de Ciencias, Pontificia Universidad Católica del Perú.
01.2020	<i>El Hielo de Marte: Glaciología Marciana en Ushuaia</i> – Keynote public talk during the 7th International Conference on Mars Polar Science and Exploration, Ushuaia, Tierra del Fuego, Argentina.
03.2019	<i>Estudios de la superficie de Marte con el Colour and Stereo Surface Imaging System (CaSSIS) a bordo de Trace Gas Orbiter de ESA</i> – Curso de Geomorfología de la Patagonia Argentina, Universidad de la Patagonia Austral, Río Gallegos, Santa Cruz, Argentina.
11.2018	“Listening to Mars' Polar Climate Record” – Invited outreach presentation for Astronomy on Tap, Bern
10.2018	<i>Imaging of the Martian surface by the Colour and Stereo Surface Imaging System (CaSSIS) of ExoMars Trace Gas Orbiter</i> – Center for Space Habitability Lunch Seminar, Universität Bern

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| 03.2018 | <i>The Icy Polar Deposits of Mars and their Connection to Climate</i> – Earth and Atmospheric Sciences Seminar Series, Georgia Institute of Technology, Atlanta, GA, USA. |
| 08.2017 | <i>Polar Stratigraphy</i> – Short Course Lecture for the Keck Institute for Space Science Workshop “Unlocking the Climate Record Stored within Mars’ Polar Layered Deposits I”. California Institute of Technology, Pasadena, CA, USA. |
| 11.2016 | <i>Decifrando el Récord Climático de los Polos de Marte</i> – Department of Physics. Pontificia Universidad Católica del Perú. San Miguel, Lima, Perú. |
| 12.2014 | <i>Halos en el Polo Sur de Marte</i> – Comisión Nacional de Investigación y Desarrollo Aeroespacial. San Isidro, Lima, Perú. |

OUTREACH AND PRESS

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| 02.2018 – Present | Management of CaSSIS social media |
| 07.2020 | SRF 10-vor-10 interview about the status and “big questions” of Mars Science |
| 09.2019 | Phys.org article “ Ice islands on Mars and Pluto could reveal past climate change ” on 2019 JGR paper with Michael M. Sori, et al. |
| 07.2019 | EOS Editors’ Highlight and Cover Image on 2019 GRL paper: Timescales of the climate record in the south polar ice cap of Mars |
| 06.2019 | Designed the CaSSIS Mars display for the “Bern im All” event on the Bern Bundesplatz in celebration of 50 years of the Apollo 11 Moon landing |
| 12.2018 – Present | External advisor to “The Mars Society – Chile” |
| 05.2018 – Present | Founder of the “Planetólogos Latinos” Facebook group: A community of Latin-American planetary scientists |
| 07.2018 – 12.2019 | Astronomy on Tap – Bern: Organisation collaborator |
| 02.2017 | EOS Research Spotlight on 2017 GRL paper: Signals of astronomical climate forcing in the exposure topography of the North Polar Layered Deposits of Mars |
| 12.2016 | Interview on Radio Capital in Lima, Peru to promote the study of planetary science within the Peruvian high-school and university student community |
| 2014, 2015 | Outreach presentations on planetary science in Tucson, AZ, USA and Lima, Peru |

SKILLS

Data analysis and computing

- Pattern detection in imaging data through time-series analysis and signal matching
- Data analysis: Imaging, spectroscopy, sub-surface sounding radar, topography
- Remote sensing software: ESRI® ArcGIS, ENVI Image Processing and Analysis, Java Mission-planning and Analysis for Remote Sensing (JMARS), NASA NAIF SPICE Toolkit
- USGS Integrated Software for Imagers and Spectrometers (ISIS3)
- Photogrammetric Processing of Planetary Stereo Imaging with SOCET SET®
- Programming: IDL (intermediate-advanced); Matlab, C, Python (basic)
- Unix/Linux, Mac OSX, MS Windows, MS Office, MS Project, Adobe Creative Suite, and Internet tools

Laboratory Experience

- Measurement of electrical properties of samples with a Vector Network Analyzer (VNA)
- Measurement of the bi-directional reflectance distribution function (BRDF) of a variety of samples
- Granular sample handling: grain size distribution control, particle density measurements

Field Experience

- Field courses and expeditions in Argentina, Hawai’i, Iceland, and southwestern USA

PROFESSIONAL MEMBERSHIPS

- European Geosciences Union
- American Astronomical Society, Division of Planetary Sciences
- American Geophysical Union

- Europlanet Society
- The Planetary Society
- International Association of Cryospheric Sciences

LANGUAGES

Spanish-English fully bilingual, Italian (B2/C1), German (A2/B1), French (A1)

PEER-REVIEWED PUBLICATIONS

* Research advisee/student.

- Pascuzzo, A.C., A.M. Bramson, **P. Becerra**, J.F. Mustard. Development and evolution of exposed icy layers at Mars north pole through space and time, *in prep.*
- Almeida, M., M. Read, N. Thomas, G. Cremonese, **P. Becerra**, G. Borrini, M. Gruber, R. Heyd, C.M. Marriner, G. McArthur, A.S. McEwen, A. Pommerol, J. Perry, C. Schaller (2021) Planning targeted images on Mars with ExoMars' Colour and Stereo Surface Imaging System, *in prep. for Planetary and Space Science*
- Tornabene L.L., **P. Becerra**, V. Rangarajan, F. Seelos, S. Byrne, C. Cesar, S. Conway, G. Cremonese, A. Lucchetti, G. Munaretto, A. McEwen, M. Pajola, M. Patel, L. Perry, A. Pommerol, N. Thomas, J. Wray, *A. Valantinas (2021) Colour and multispectral analysis with the ExoMars Trace Gas Orbiter's Colour and Stereo Surface Imaging System (CaSSIS), *in prep. for Planetary and Space Science*
- Lethuillier, A., E. Kaufmann, C. Feller, **P. Becerra**, A. Pommerol, N. Hännidd, D. Haack, D. Rebecca, B. Gundlach, J. Blum, G. Kargl, J. Knollenberg, N. S. Molinski, T. Gilke, H. Sierks, P. Tiefenbacher, H. Capelo, C. Güttler, K. Otto, D. Bischoff, M. Schweighart (2021) Cometary dust analogue for physics experiments, *under review for Mon. Not. R. Astron. Soc.*
- *Valantinas, A., **P. Becerra**, A. Pommerol, N. Thomas, E. Hauber, L.L. Tornabene, A.S. McEwen, G. Cremonese (2021) Multi-Angular Observations of Martian Slope Streaks, *under review for Planetary and Space Science (CaSSIS special issue)*
- Grau Galofre A., Serla J., **P. Becerra** (2021) Gelifluction lobes inside Reull Vallis: A case study for the integration of CaSSIS data, *under review in Planetary and Space Science (CaSSIS special issue)*
- Pommerol, A., N. Thomas, **P. Becerra**, M. Almeida, M. Read, E. Simioni, C. Re, G. Cremonese, A. McEwen, J. Perry, L. Tornabene, S. Tulyakov (2021) In-flight photometric calibration of images taken by the ExoMars TGO Colour and Stereo Surface Imaging System, *under review in Planetary and Space Science (CaSSIS special issue)*
- Munaretto, G., M. Pajola, A. Lucchetti, G. Cremonese, E. Simioni, C. Re, S. Bertoli, L. Tornabene, A. McEwen, **P. Becerra**, V.G. Rangarajan, A. Valantinas, A. Pommerol, N. Thomas, G. Portyankina (2021) Multiband photometry of Martian Recurring Slope Lineae (RSL) and dust-removed features at Horowitz crater, Mars from TGO/CaSSIS color observations, *under review in Planetary and Space Science (CaSSIS special issue)*
- Becerra, P.**, I.B. Smith, C. Andres, A.M. Bramson, P. Buhler, A. Coronato, S. Diniega, J.A. Emmett, A. Grau Galofre, C. Hery, S. Hibbard, M.A. Kahre, J.P. Knightly, S. Nerozzi, G. Portyankina, J. Rabassa, L. Tappari, T. Titus, J.L. Whitten, Z. Yoldi (2021), Past, Present and Future of Mars Polar Science: Outcomes and outlook from the 7th International Conference on Mars Polar Science and Exploration, *under minor revisions for The Planetary Science Journal*
- Dundas, C.M., **P. Becerra**, S. Byrne, M. Chojnacki, I. J. Daubar, S. Diniega, C.J. Hansen, K.E. Herkenhoff, M. Landis, A.S. McEwen, G. Portyankina, *A. Valantinas (2021) Active Mars: A Dynamic World, *J. of Geophys. Res.: Planets*, <https://doi.org/10.1029/2021JE006876>
- Thomas, N., **P. Becerra**, I.B. Smith, (2021) Mars and the ESA Science Programme: The case for Mars Polar Science, *Experimental Astronomy*, <https://doi.org/10.1007/s10686-021-09760-6>
- Becerra, P.**, I.B. Smith, A. Coronato, J. Rabassa (2020). Mars Polar Science visits the End of the World. *Nature Astronomy* (Meeting Report). <https://doi.org/10.1038/s41550-020-1127-y>
- G. Munaretto, M. Pajola, G. Cremonese, C. Re, A. Lucchetti, E. Simioni, A. S. McEwen, A. Pommerol, **P. Becerra**, S. J. Conway, N. Thomas, M. Massironi (2020), First CaSSIS observations of Martian Recurring Slope Lineae: implications for their origin and evolution, *Planetary and Space Science* 187, <https://doi.org/10.1016/j.pss.2020.104947>
- Smith, I.B., P.O. Hayne, S. Byrne, **P. Becerra**, M. Kahre, W. Calvin, C.S. Hvidberg, S. Milkovich, P. Buhler, M. Landis, B. Horgan, A. Kleinbohl, M. Perry, R. Obbard, J. Stern, S. Piqueux, N. Thomas, K. Zacny, L. Carter, L. Edgar, J. Emmett, T. Navarro, J. Hanley, M. Koutnik, N. Putzig, B. Henderson, J.W. Holt, B. Ehlmann, S. Parra, D. Lalich, C. Hansen, M. Hecht, D. Banfield, K. Herkenhoff, D.A. Paige, M. Skidmore, R.L. Staehle, M. Siegler (2020) The Holy Grail: A Strategy for Unlocking the Climate Record Stored within

- Mars' Polar Layered Deposits, *Planetary and Space Science*, 184, <https://doi.org/10.1016/j.pss.2020.104841>.
- Sori, M.M., J. Bapst, **P. Becerra**, and S. Byrne (2019), Islands of ice on Mars and Pluto, *J. of Geophys. Res.: Planets*, 124. <https://doi.org/10.1029/2018JE005861>. Cover of the issue.
- Becerra, P.**, Sori, M. M., Thomas, N., Pommerol, A., Simioni, E., Sutton, S. S., Tulyakov, S., Cremonese, G. (2019). Timescales of the climate record in the south polar ice cap of Mars. *Geophys. Res. Lett.* 46, 7268–7277. <https://doi.org/10.1029/2019GL083588>. AGU Eos Editors' Highlight (<2% of papers are highlighted) and cover of the issue.
- Brouet, Y., **Becerra, P.**, Sabouroux, P., Pommerol, A., Thomas, N., (2018), A Laboratory-based Dielectric Model for the Radar Sounding of the Martian Subsurface, *Icarus* 321: 960-973, <https://doi.org/10.1016/j.icarus.2018.12.029>.
- Brouet, Y., Cerubini, R., Pommerol, A., Thomas, N., Neves, L., Sabouroux, **P., Becerra, P.**, Grima, C., (2018) Dielectric spectroscopy measurements of saline aqueous solutions in the VHF-UHF bands: towards a dielectric model for icy satellites' water reservoirs. *Proceedings of the 5th IEEE International Workshop on Metrology for Aerospace*. <https://doi.org/10.1109/MetroAeroSpace.2018.8453527>
- Smith, I.B., S. Diniega, D.W. Beaty, T. Thorsteinsson, **P. Becerra**, A. M. Bramson, S.M. Clifford, C.S. Hvidberg, G. Portyankina, S. Piqueux, A. Spiga and T.N. Titus (2018), 6th international conference on Mars polar science and exploration: Conference summary and five top questions, *Icarus* 308: 2-14, <https://doi.org/10.1016/j.icarus.2017.06.027>
- Tornabene, L.L, F. P. Seelos, A. Pommerol, N. Thomas, C.M. Caudill, **P. Becerra**, J.C. Bridges, S. Byrne, M. Cardinale, M. Chojnacki, S.J. Conway, G. Cremonese, C.M. Dundas, M.R. El-Maarry, C.J. Hansen, K. Hansen, T.N. Harrison, R. Henson, L. Marinangeli, A.S. McEwen, M. Pajola, S.S. Sutton, J.J. Wray (2018), Simulation and assessment of the colour and spatial capabilities of the Colour and Stereo Surface Imaging System (CaSSIS) on the ExoMars Trace Gas Orbiter, *Space Sci. Rev.* 214: 18. <https://doi.org/10.1007/s11214-017-0436-7>.
- Becerra, P.**, M. M. Sori, and S. Byrne (2017), Signals of astronomical climate forcing in the exposure topography of the North Polar Layered Deposits of Mars, *Geophys. Res. Lett.*, 44, 62–70, <https://doi.org/10.1002/2016GL071197>. AGU Eos Research Spotlight.
- Becerra, P.**, S. Byrne, M. M. Sori, S. Sutton, and K. E. Herkenhoff (2016), Stratigraphy of the north polar layered deposits of Mars from high-resolution topography, *J. Geophys. Res. Planets*, 121, 1445–1471, <https://doi.org/10.1002/2015JE004992>.
- Brown, A. J., Calvin, W.M., **Becerra, P.**, Byrne, S. (2016), Martian north polar cap summer water cycle, *Icarus*, 277, 401 - 415, doi:10.1016/j.icarus.2016.05.007.
- Thompson, M.S., Zega, T.J., **Becerra, P.**, Keane, J.T., Byrne, S. (2016). The Oxidation State of Nanophase Fe Particles in Lunar Soil: Implications for Space Weathering. *Meteoritics and Planetary Science* 51, 6: 1082–1095. <https://doi.org/10.1111/maps.12646>.
- Becerra, P.**, Byrne, S., Brown A. J. (2015). Transient Bright “halos” on the South Polar Residual Cap of Mars: Implications for mass balance. *Icarus* 251: 211-225. doi: 10.1016/j.icarus.2014.04.050.
- Pelletier, J. D., DeLong, S. B., Orem, C. A., **Becerra, P.**, Compton, K., Gressett, K., Lyons-Baral, J., McGuire, L. A., Molaro, J. L., and Spinler J. C. (2012). How do vegetation bands form in dry lands? Insights from numerical modelling and field studies in southern Nevada, USA. *J. Geophys. Res.*, 117, F04026, <https://doi.org/10.1029/2012JF002465>.
- French, R.S., Showalter, M. R., Sfair, R., Argüelles, C., Pajuelo, M., **Becerra, P.**, Hedman, M. M., Nicholson, P. D. (2012). The Brightening of Saturn's F Ring. *Icarus* 219: 181-193. <https://doi.org/10.1016/j.icarus.2012.02.020>

OTHER NON-REFEREED PUBLICATIONS

- Becerra, P.**, A.M. Bramson, A.J. Brown, S. Byrne, A. Coronato, S. Diniega, A. Grau Galofre, P. O. Hayne, B. Horgan, C. S. Hvidberg, M.E. Landis, R.W. Obbard, A. Pascuzzo, J. J. Plaut, G. Portyankina, N.E. Putzig, J. Rabassa, I. B. Smith, M. M. Sori, L. Tamppari, N. Thomas, J. Whitten, The Importance of the Climate Record in the Martian Polar Caps, White Paper submitted to the *NASA Planetary Sciences Decadal Survey 2023-2032*
- Smith, I.B., Byrne, S., Hayne, P.O., **P. Becerra**, et al. Unlocking the Climate Record Stored within Mars' Polar Layered Deposits, Mission White Paper submitted to the *NASA Planetary Sciences Decadal Survey 2023-2032*
- Smith, I.B., **P. Becerra**, et al. Solar-System-Wide Significance of Mars Polar Science, White Paper submitted to the *NASA Planetary Sciences Decadal Survey 2023-2032*
- Grau Galofre, A., C. Andres, **P. Becerra**, A. Bhardwaj, F. Butcher, P.R. Christensen, S.J. Conway, E. Hauber, S. Hibbard, J.P. Knightly, T. Meng, G.R. Osinski, E.I. Petersen, J. Plaut, L. Sam, J. Serla, K.X. Whipple, A

- Comparative View of Glacial and Periglacial Landforms on Earth and Mars, White Paper submitted to the *NASA Planetary Sciences Decadal Survey 2023-2032*
- Bramson, A.M., J. Bapst, **P. Becerra**, S.W. Courville, C.M. Dundas, S.M. Hibbard, S. Karunatillake, G.A. Morgan, M.R. Perry, E.I. Petersen, N.E. Putzig, H.G. Sizemore, I.B. Smith, D.E. Stillman, P. Wooster (2020) Mid-Latitude Ice on Mars: A Science Target for Planetary Climate Histories and a Resource for Exploration, White Paper submitted to the *NASA Planetary Sciences Decadal Survey 2023-2032*
- Brown, A.J., **P. Becerra**, et al., The case for a multi-channel polarization sensitive LIDAR for investigation of insolation-driven ices and atmospheres, White Paper submitted to the *NASA Planetary Sciences Decadal Survey 2023-2032*
- Keane, J.T., F. Bagenal, A.C. Barr, K. Basu, **P. Becerra**, et al. The Case for Io, White Paper submitted to the *NASA Planetary Sciences Decadal Survey 2023-2032*
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FIRST AUTHOR CONFERENCE ABSTRACTS

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- *Valantinas, A., **P. Becerra**, L.L. Tornabene, A. Pommerol, E. Hauber, A.S. McEwen, N. Thomas, N. Schorghofer, G. Cremonese and the CaSSIS Team (2021). Colour and multi-angular observations of Martian slope streaks. Lunar and Planetary Science Conference LII. Poster. Abs. 2731
- *Valantinas, V., **P. Becerra**, L. L. Tornabene, A. Pommerol, E. Hauber, N. Thomas, A. McEwen, and G. Cremonese (2020). Multi-angular Observations of Martian Bright Slope Streaks. Europlanet Science Congress 2020. Talk. EPSC2020-1062.
- Becerra P.**, C. Hery, A. Valantinas, S. Byrne, N. Thomas, S. Conway (2020). Avalanches of the Martian North polar cap. Europlanet Science Congress 2020. Poster. EPSC2020-1093.
- Becerra, P.**, Conway, S., N. Thomas. (2020). Avalanches of the Martian North polar cap. EGU General Assembly 2020. Poster. EGU2020-22331.
- *Valantinas, A., **P. Becerra**, N. Thomas, A. Pommerol, G. Cremonese, and the CaSSIS Team (2020) Low latitude dawn observations of mars using the colour and stereo surface imaging system (CaSSIS). Lunar and Planetary Science Conference LI. Poster. Abs. 2453.
- *Valantinas, A., **P. Becerra**, N. Thomas, A. Pommerol, E. Hauber, L. L. Tornabene, A. McEwen, G. Cremonese and the CaSSIS Team (2020). Multi-angular observations of martian bright slope streaks. Lunar and Planetary Science Conference LI. Poster. Abs. 2419.
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- Becerra, P.**, M. M. Sori, N. Thomas, S. Tulyakov, S. S. Sutton, A. Pommerol, G. Cremonese, The HiRISE Team, The CaSSIS Team. (2019). Climate Record Signals in the South Polar Cap of Mars from HiRISE and CaSSIS Stereo Imaging. Lunar and Planetary Science Conference L. Abs. 1283. Talk
- Becerra, P.**, Nunes, D., Smith, I., Sori, M.M., Brouet, Y., Thomas, N. The Radar and Visible Stratigraphic Records of Mars' North Polar Layered Deposits. (2018). European Planetary Science Congress. Poster. Abs. 2018-1171.
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- Becerra, P.**, Byrne, S., Mattson, S., Pelletier, J.D., Herkenhoff K.E., The HiRISE Team. (2014). Martian Polar Stratigraphy from HiRISE Stereo Topography. Poster. Sigma Xi International Research Conference.
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- Becerra, P.**, Byrne, S., Brown A.J. (2014). Transient Bright "Halos" on the South Polar Residual Cap of Mars: Implications for Mass Balance. Talk. European Planetary Science Congress. Abs. 634.
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- Becerra, P.**, Byrne, S., Mattson, S., Herkenhoff K.E., HiRISE Team. (2014). Martian Polar Stratigraphy from HiRISE Stereo Topography. Poster. Lunar and Planetary Science Conference XLV. Abs. 2408
- Becerra, P.**, Byrne, S., Brown, A.J. (2013). Dust-Driven Halos on the Martian South Polar Residual Cap. Poster. ID P41A-1913. American Geophysical Union Fall Meeting.
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- Becerra, P.**, and Byrne, S. (2011). Modeling the Formation of CO₂ Frost Halos on the South Polar Residual Cap of Mars. Fifth International Conference on Mars Polar Science and Exploration. Talk. Abs. 6024.
- Becerra, P.**, and Byrne, S. (2011). Investigating Trigger Mechanisms of Martian North Polar Avalanches. Fifth International Conference on Mars Polar Science and Exploration. Talk. Abs. 6034.
- Becerra, P.**, and Byrne, S. (2011). Mars' South Polar Halos and Triton's Aureoles: Sublimation-Driven Models of Formation. Poster. New Horizons Workshop on Icy Surfaces. Lowell Observatory, Flagstaff, AZ. http://www2.lowell.edu/workshops/aug2011/workshop_abstracts/becerra.pdf
- Becerra, P.**, and Byrne, S. (2011). Modeling the Formation of CO₂ Frost Halos on the South Polar Residual Cap of Mars. Talk. Lunar and Planetary Science Conference XLII Abs. 2252.
- Becerra, P.**, and Byrne, S. (2010). Modeling the Formation of CO₂ Frost Halos on the South Polar Residual Cap of Mars. Poster. Lunar and Planetary Science Conference XLI Abs. 2097.

INTERESTS AND ACTIVITIES

Volunteer aid: University of Arizona Health Network (06.13 – 12.13) volunteer in Pediatric Chronic Diseases wing; Census aid after the 2008 Earthquake in Pisco, Peru.

Extra-curricular: SCUBA diving, cycling, triathlon, rock climbing and mountaineering, snowboarding, skiing, playing guitar, singing, cooking and mixology.

References available upon request.