

Patricio Becerra, Ph.D.

Curriculum Vitae

Space Research and Planetary Sciences
 Physikalisches Institut
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EDUCATION

University of Arizona, Tucson, AZ, USA

Doctor of Philosophy [PhD], Planetary Sciences (Minor in Geosciences) Conferred: **08/2016**
 Dissertation: “The Poles of Mars, Past and Present: A high-resolution observational study of the Martian Polar Regions and their connection to climate”. Advisor: Prof. Shane Byrne

Master of Science [MSc], Planetary Sciences Conferred: **11/2015**

Graduate Certificate in Engineering Management Conferred: **12/2013**

Pontificia Universidad Católica del Perú, Lima, Peru

Bachelor of Science [BSc], Physics Conferred: **02/2008**

HONORS AND AWARDS

Geosciences Travel Award	04/2019
Universität Bern Young Academics Support Award	04/2019
Sigma Xi International Research Conference Superior Student Presentation Award	11/2014
University of Arizona College of Science Galileo Circle Scholar	04/2014
Lunar and Planetary Institute Career Development Award	02/2014
NASA Earth and Space Science Fellowship	05/2013
Lunar and Planetary Laboratory Graduate Teaching Excellence Award	04/2013

PROFESSIONAL POSITIONS HELD

Micro-cameras & Space Exploration SA (MCSE), Neuchâtel, Switzerland

Project Manager RadCam Colour Chart **01/2021 – Present**
 - Manage a project to develop a flight-ready colour calibration chart for the JUICE Monitoring Cameras (JMC) on ESA’s JUPiter Icy moons Explorer mission

PlanetS Technology Platform Knowledge Transfer Extern **04/2021 – 06/2021**
 - Development of a digital model of MCSE’s flagship micro camera for space applications
 MCAM

Planetary Imaging Group, Physikalisches Institut, Universität Bern, Bern, Switzerland

Postdoctoral Researcher in Space Research and Planetary Sciences **02/2017 – Present**
 Advisor: Prof. Nicolas Thomas, Physikalisches Institut Director.

- Paleoclimatology and stratigraphy of the Martian Polar Layered Deposits
- Remote sensing of the Martian surface
- Laboratory-based microwave studies of planetary analogue materials

**Lunar and Planetary Laboratory, Department of Planetary Sciences, University of Arizona,
Tucson, AZ, USA**

Research Specialist

08/2016 – 01/2017

Advisor: Prof. Shane Byrne, Associate Professor of Planetary Sciences.

- Periodicity analysis of the surface texture of the North Polar Residual Cap of Mars

**Lunar and Planetary Laboratory, Department of Planetary Sciences, University of Arizona,
Tucson, AZ, USA**

Graduate Research Associate

09/2009 – 07/2016

Advisor: Prof. Shane Byrne, Associate Professor of Planetary Sciences.

- Observations, image processing, and surface reflectance modelling of transient features on the south polar residual cap of Mars. Funded by Dr. Byrne's NASA Mars Data Analysis Program grant number NNX09AM01G.
- Quantitative analysis of Mars polar stratigraphy using high-resolution topographic data. Funded by own NASA Earth and Space Science Fellowship award number NNX13AO55H.

**National Commission for Aerospace Research and Development (CONIDA) – Peruvian Space
Agency, Lima, Peru**

Research Assistant: Astronomy Department

03/2007 – 05/2009

Department Lead: Walter Guevara

- Founded Planetary Science Research group.
- Photometric analysis of Saturn's F-ring from NASA Cassini's Imaging Science Subsystem (ISS). External Advisor: Dr. Mark Showalter (SETI/NASA Ames)
- Observations and data reduction to evaluate sky conditions for the construction of an observatory in Moquegua, Peru. Established a working relationship with surrounding agricultural communities, contributing to their education and development.

Gemini Observatory (Gemini South), La Serena, Chile

Trainee: Observational Astronomy

08/2007

Advisor: Dr. Percy Gómez, Associate Scientist

- Image processing and photometry of star clusters

PLANETARY EXPLORATION MISSION INVOLVEMENT

**2019 NASA Discovery Mission Proposal: Climate Orbiter for Mars Polar Atmospheric and
Subsurface Science (COMPASS). *Not Selected***

Co-Investigator

09/2018 – 02/2020

Colour and Stereo Surface Imaging System (CaSSIS) – ESA ExoMars Trace Gas Orbiter (TGO)

Science Theme Deputy Lead (STDL) for Ice and Periglacial Processes

02/2017 – Present

- Management of observation campaigns, target prioritization, review of acquired images

CaSSIS Targeting Lead (CaTL)

02/2017 – Present

- Selection of scientifically relevant targets for observation
- Planning of observations
- Image compression testing

High Resolution Imaging Science Experiment (HiRISE) – NASA Mars Reconnaissance Orbiter (MRO)

Science Theme Lead (STL) for Climate Change **07/2016 – Present**
 - Management of observation campaigns, target prioritization, review of acquired images

Junior Science Team Member **08/2010 – 07/2016**
 - Image analysis and Digital Terrain Model (DTM) production

NASA Planetary Science Summer School

Session III. Mission: Argus - Io Observer **08/2014**

Risk and Programmatic Chair
 - Analysed risk and designed mitigation strategies for the mission proposal. Designed schedule and milestone program for the mission.

Principal Investigator for the Io GLobal Optical Observer (IGLOO) instrument
 - Led the IGLOO (multiband imager) instrument team, decided on instrument-specific science objectives and conceived the instrument design.

APPROVED RESEARCH GRANTS

Investigation of the solar system using remote sensing and laboratory techniques. Swiss National Science Foundation (SNF) grant 200020_178847

Contributor **04/2018 – 03/2020**

Ice Deposits in Polar Craters on Mars. NASA Mars Data Analysis Program grant number 80NSSC17K0510. NASA, USA

Contributor **09/2016 – 08/2020**

Wavelet Analysis of Martian Polar Stratigraphy from HiRISE Topography. NASA Earth and Space Science Fellowship grant NNX13AO55H. NASA, USA

Student Principal Investigator **09/2013 – 08/2016**

SUPERVISION AND ADVISING OF JUNIOR RESEARCHERS

Lukas Affolter **08/2020 – Present**

M.Sc. student, University of Bern. Dielectric and photometric properties of Martian simulant soils. Co-supervised with Dr. Antoine Pommerol.

Adomas Valantinas **09/2018 – Present**

Ph.D. student, University of Bern. Remote Sensing Analysis of Slope Streaks in Arabia Terra, Mars. Official supervisor: Prof. Nicolas Thomas

Camila Cesar **09/2018 – Present**

Ph.D. student, University of Bern. Studies of Polar Spots on Mars. Co-supervised with Dr. Antoine Pommerol. Official supervisor: Prof. Nicolas Thomas

Alyssa Pascuzzo **01/2020 – Present**

Ph.D. student, Brown University. Advising and collaborating on the project: Hyperspectral assessment of the layering mechanisms of the North Polar Layered Deposits of Mars. Thesis advisor: Prof. Jack Mustard

Sergio Parra **09/2017 – 09/2018**

B.Sc., Student, Georgia Institute of Technology (Now a Ph.D. student at the California Institute of Technology – Caltech). Surface texture of the North Polar Residual Cap of Mars. Institutional advisor: Dr. Sarah M. Milkovich (JPL)

TEACHING

Physikalisches Institut, Universität Bern, Bern, Switzerland

Teaching Assistant in Laborkurs Moderne Physik II **Fall 2017 – 2020**

Instructor: Prof. Ingo Leya

- In charge of “Light Scattering” gonio-radiometer experiment

Teaching Assistant in Physikpraktikum für Minor Physik und Pharmazie **Spring 2020**

Instructor: Prof. Ingo Leya

- In charge of “Diffraction” experiment

Teaching Assistant in Physik Praktikum Studierende Biologie **Spring 2018**

Instructors: Prof. Michele Weber, Prof. Saverio Braccini

Department of Planetary Sciences, The University of Arizona, Tucson, AZ, USA

Guest Lecturer PTYS554: Evolution of Planetary Surfaces (Graduate level course) **Fall 2015**

Teaching Assistant PTYS214: “Astrobiology: A Planetary Perspective” **Fall 2012**

Instructor: Prof. Ilaria Pascucci

Teaching Assistant, Guest Lecturer PTYS170B1: “The Universe and Humanity” **Spring 2012**

Instructor: Prof. Tamara Rogers

- Lunar and Planetary Laboratory Graduate Teaching Excellence Award

PROFESSIONAL SERVICE AND INSTITUTIONAL INVOLVEMENT

Institutional Responsibilities

Centre for Space Research & Planetary Sciences (WP), Universität Bern, **02/2017 – Present**
Seminar Series: Committee Member

Lunar and Planetary Laboratory Conference: Co-organiser **08/2010 – 08/2012**

Lunar and Planetary Laboratory “Mission Work” Seminar Series: Organiser **03/2014 – 03/2015**

Involvement in Conferences and Workshops

COSPAR Capacity building workshop on planetary science data analysis: **Rescheduled for**
Lecturer representing MRO and TGO/CaSSIS **07/2021**

Europlanet Science Congress (EPSC) 2020 Interviews. Voyage 2050 **09/2020**
Interviewee. White paper author perspective.

7th International Conference on Mars Polar Science and Exploration, Ushuaia, **09/2016 – 01/2020**
Argentina: **Co-Lead Organizer and Convener**

Ninth International Conference on Mars: Session Chair **07/2019**

Keck Institute for Space Science Workshop “Unlocking the Climate Record
Stored within Mars' Polar Layered Deposits I and II”: Invited lecturer
and workshop participant **2017, 2018**

Lunar and Planetary Science Conference: GSA Dwornik Award Judge	2017 – 2018
6 th International Conference on Mars Polar Science and Exploration: Session chair	09/2016
47 th Lunar and Planetary Science Conference: Session chair	03/2016
First Short Course on Planetology (CONIDA, Lima, Peru). Lead organizer and Convener	11/2008
COSPAR Capacity building workshop on planetary science: Student participant	07/2007

Scientific Review

Reviewer for: <i>Icarus</i> (2017 certificate of outstanding contribution in reviewing), <i>Planetary and Space Science</i> , <i>Science Advances</i> , <i>Monthly Notices of the Royal Astronomical Society</i> , <i>Journal of Geophysical Research – Planets</i>	2015 – Present
NASA ROSES Planetary Science Research Program: Panelist and External Reviewer	2017 – Present
NASA ROSES Planetary Science Instrument Development Program: Executive Secretary	2016

INVITED TALKS

<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	02/2021
<i>Radar investigations of ice bodies on Mars</i> – Seminar on Microwave Physics and Atmospheric Physics. Physics Institute, University of Bern.	10/2020
<i>Los hielos polares de Marte y su registro climático</i> – Coloquios de Física. Departamento Académico de Ciencias, Pontificia Universidad Católica del Perú.	09/2020
<i>El Hielo de Marte: Glaciología Marciana en Ushuaia</i> – Keynote public talk during the 7 th International Conference on Mars Polar Science and Exploration, Ushuaia, Tierra del Fuego, Argentina.	01/2020
<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.	03/2019
<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	10/2018
<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.	03/2018
<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.	08/2017

<i>Decifrando el Récord Climático de los Polos de Marte</i> – Department of Physics. Pontificia Universidad Católica del Perú. San Miguel, Lima, Perú.	11/2016
<i>Halos en el Polo Sur de Marte</i> – Comisión Nacional de Investigación y Desarrollo Aeroespacial. San Isidro, Lima, Perú.	12/2014

OUTREACH

Member of the EuroPlanet Early Career Network “New Frontiers” and “EPSC” Working Groups.	09/2019 – Present
Management of CaSSIS press and social media	02/2018 – Present
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	06/2019
External advisor to “The Mars Society – Chile”	12/2018 – Present
Founder of the “Planetólogos Latinos” Facebook group: A community of Latin-American planetary scientists	05/2018 – Present
Talk for Astronomy on Tap – Bern: “Listening to Mars’ Polar Climate Record”	11/2018
Astronomy on Tap – Bern: Collaborator	07/2018 – 12/2019
Outreach presentations on planetary science in Tucson, AZ, USA and Lima, Peru	2014, 2015

PRESS

SRF 10-vor-10 interview about the status and “big questions” of Mars Science	07/2020
Phys.org article “ Ice islands on Mars and Pluto could reveal past climate change ” on 2019 JGR paper with Michael M. Sori, et al.	09/2019
EOS Editors’ Highlight and Cover Image on 2019 GRL paper: Timescales of the climate record in the south polar ice cap of Mars	07/2019
EOS Research Spotlight on 2017 GRL paper: Signals of astronomical climate forcing in the exposure topography of the North Polar Layered Deposits of Mars	02/2017
Interview on Radio Capital in Lima, Peru to promote the study of planetary science within the Peruvian student community.	12/2016
Outreach Interview for Punto edu (Pontificia Universidad Católica del Perú)	04/2015

SKILLS

Data analysis and computing

- Remote sensing data experience:
 - Imaging: HiRISE, MRO Context Camera (CTX), CaSSIS, Mars Orbiter Camera (MOC)
 - Imaging spectroscopy: Compact Reconnaissance Imaging Spectrometer for Mars (CRISM)
 - Radar: Shallow Radar (SHARAD)
 - Topography: Mars Orbiter Laser Altimeter (MOLA), HiRISE and CaSSIS Digital Terrain Models
 - Attended science team meetings of HiRISE, CaSSIS, and SHARAD
 - Attended Science Working Team (SWT) meetings for ExoMars TGO

- NASA NAIF SPICE Toolkit (Domestic training class, Columbia, MD. October 2014)
- ESRI ArcGIS
- ENVI Image Processing and Analysis
- Java Mission-planning and Analysis for Remote Sensing (JMARS)
- PLAN-C planning software for CaSSIS targeting
- USGS Integrated Software for Imagers and Spectrometers (ISIS3)
- Photogrammetric Processing of Planetary Stereo Imaging with SOCET SET[®]
- Programming: IDL (Advanced), Matlab (Intermediate), Python, C (Basic)
- Unix/Linux, Mac OSX, MS Windows, MS Office, MS Project, and Internet tools

Laboratory Experience

- Coaxial microwave measurement of dielectric properties of wet and granular samples (EpsiMu[®])
- Granular sample handling and grain size distribution control (Advantech Varisifter[™])
- Particle density measurements with Helium pycnometer (Quantachrome[®] Upyc-1200e-V5.04)
- Ice simulant production using the University of Bern's Setups for Production of Icy Planetary Analogues (SPIPA)
- Goniometry (Physikalisches Institut Radiometric Experiment – PHIRE)

Field Experience

- Santa Cruz, Argentina **Spring 2019**
 - Completed a field course in quaternary geomorphology of the Austral Patagonia
- Volcanoes National Park, Hawai'i **Spring 2014**
 - Roughness measurements of lava flows from Kilauea and Mauna Ulu, Volcanoes National Park, Hawai'i
- Southern Nevada **Spring 2012**
 - Terrestrial Laser Scanning, soil shear strength and infiltration rate measurements to understand the formation of vegetation bands in dry lands
- Various locations throughout the Southwestern United States **Fall 2009 – Spring 2014**
 - Educational field trips as part of a Planetary Geology Field Practicum class
 - Focus on comparing terrestrial geology to landforms on other planetary surfaces

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

PEER-REVIEWED PUBLICATIONS

* Research advisee/student

*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, *in prep. 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, *in prep. for 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, *in prep. for Planetary and Space Science CaSSIS special issue*
- 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 CaSSIS special issue*
- 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 (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 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. Herny, S. Hibbard, M.A. Kahre, J.P. Knightly, S. Nerozzi, G. Portyankina, J. Rabassa, L. Tampari, T. Titus, J.L. Whitten, Z. Yoldi (2021), Past, Present and Future of Mars Ice Research: Conclusions and outlook from the 7th International Conference on Mars Polar Science and Exploration, *in prep. for The Planetary Science Journal*
- 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, *in prep. for MNRAS*
- 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, *submitted to J. of Geophys. Res.: Planets*
- Thomas, N., **P. Becerra**, I.B. Smith, (2021) Mars and the ESA Science Programme: The case for Mars Polar Science, *submitted to Experimental Astronomy*
- 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 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, 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*. [10.1109/MetroAeroSpace.2018.8453527](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, [doi:10.1016/j.icarus.2017.06.027](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. [doi:10.1007/s11214-017-0436-7](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, [doi:10.1002/2016GL071197](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, [doi:10.1002/2015JE004992](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](https://doi.org/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. [doi: 10.1111/maps.12646](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](https://doi.org/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, [doi:10.1029/2012JF002465](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. doi: [10.1016/j.icarus.2012.02.020](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. Tappari, 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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2009

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LANGUAGES

- Spanish/English Balanced Bilingual
- Italian: Upper-intermediate (B2). Completed course at Istituto Italiano, Firenze, Italia
- German: Pre-Intermediate (A2). Inlingua Language School, Bern, Switzerland.

EXTRA-CURRICULAR

- SCUBA and Free Diving
 - 74 logged SCUBA dives
 - PADI Rescue Diver (Emergency First Responder), Peak Performance Buoyancy Specialty Diver, Dry suit Specialty Diver, Freediver

- Volunteering
 - University of Arizona Health Network (Jun – Dec 2013): Volunteer in Pediatric Chronic Diseases
 - Census aid after the 2008 Earthquake in Pisco, Peru

- Sports:
 - Triathlon (University of Arizona Triathlon Club Alumnus)
 - Cycling (Category 4 USAC Road. University of Arizona Cycling Club Alumnus)
 - Climbing (Lead indoor up to 6a+/5.10c, outdoor up to 5c/5.9+), Ice Climbing (top rope up to 4I).
 - Snowboarding

Age: 35

Current Swiss Immigration Status: **Peruvian National. Ausweis B: Temporary residence permit for non-EU nationals**
March 23rd, 2021