

Curriculum Vitae of Samuel Patrick Dennis Birch

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LAST UPDATED: JUNE 2015

CURRENT AFFILIATION

Earth and Atmospheric Sciences Department, Cornell University

EDUCATION

Cornell University *Ithaca, NY*

Ph.D. – Planetary Science (Minors: Geophysics/Astronomy) Current -May 2019

Advised by: Dr. A. Hayes, Dr. M. Pritchard, Dr. S. Squyres and Dr. T. Jordan.

University of California Berkeley

Berkeley, CA

B.A. (Honors) – Geophysics

May 2014

Major GPA: 3.49

ACADEMIC AWARDS AND FELLOWSHIPS

NASA Earth and Space Science Fellowship (NESSF) – *Fall 2015-2018*

Cornell University travel grant - *Dec. 2014*

Graduate Student Research Assistantship - *Fall 2014*

Berkeley International Undergraduate Student Tuition Grant - *Fall 2013 and Spring 2014*

TEACHING EXPERIENCE

Cornell University; *Teaching Assistant*

- A1102: “Our Solar System” (Spring 2015)

University of California Berkeley; *Grader*

- EPS 20: “Earthquakes in your backyard” (Fall 2013)
- EPS 3: “The water planet” (Spring 2014)

PROFESSIONAL APPOINTMENTS

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- **Department of Earth and Atmospheric Sciences, Cornell University;** Ithaca, NY
 - Graduate Student; *August 2014 - Current*
 - *Specialization: Remote Sensing and mapping of planetary surfaces. Geomorphology and planetary surface processes.*
 - **Astronomy Department, Cornell University;** Ithaca, NY
 - Student Summer Intern; *May 2013 – August 2013*
 - *Specialization: Development of instrumentation and NIR spectrometer calibration. Remote Sensing and mapping of planetary surfaces.*
 - **Department of Earth and Planetary Science, University of California Berkeley;** Berkeley, CA
 - Laboratory Manager; *January 2013 – July 2014*

CURRENT RESEARCH

1. Titan Polar Geomorphology

- Using topographic data for the first time in geomorphic mapping of Titan, along with SAR and ISS imagery and available altimetry data
- Presentations at the Titan Surface Workshop in October 2014 and the AGU Fall Meeting in December 2014

2. Alluvial Fans on Titan

3. Landscape Evolution of Titan's Polar Terrains

4. Surface Processes on Comet 67P Churyumov/Gerasimenko

JOURNAL PUBLICATIONS

- [6] **S.P.D. Birch**, A. Hayes, W. Dietrich, M. Mastrogiuseppe, J. Moore, A.D. Howard, M.J. Malaska, R. Kirk, E. Turtle and J. Barnes. Geomorphology of Titan's polar terrains: Using landscape form to understand surface processes. *Icarus*, in prep (2015).
- [5] N. Button, S. Karunatillake, J. Husch, J.R. Skok, M. Rice, R. Bentley, and **S. Birch**, Distinguishing Between Terrestrial Bombsag and Dropstone Settings with Implications for Gusev and Gale Craters, Mars. *Jour. Geophys. Res.*, submitted (2015).
- [4] **S.P.D. Birch**, A. Hayes, J. Moore, A.D. Howard and J. Radebaugh. Alluvial Fan Morphology, Distribution and Formation on Titan. *Icarus*, in prep (2015).
- [3] Michael J. Malaska, R.M.C. Lopes, D.A. Williams, C.D. Neish, A. Solominidou, J. Soderblom, A.M. Schoenfeld, **S.P.D. Birch**, A.G. Hayes, A. Le Gall, M.A. Janssen, T.G. Farr, R.D. Lorenz, J. Radebaugh, E. Turtle, Geomorphologic map of the Afekan Crater region, Titan: Terrain relationships in Titan's blandlands. *Icarus*, submitted (2015).
- [2] Rosaly M.C. Lopes, M. J. Malaska, A. Solomonidou, A. Le Gall, M. A. Janssen, C.D. Neish, E.P. Turtle, **S.P.D. Birch**, A. G. Hayes, J. Radebaugh, A. Coustenis, B. W. Stiles, R. L. Kirk, K.L. Mitchell, K. J. Lawrence. Nature, Distribution, and Origin of Titan's Undifferentiated Plains, *Icarus*, submitted (2015).
- [1] **S.P.D. Birch**, M. Manga, B. Delbridge and M. Chamberlain. Penetration of spherical projectiles into wet granular media, *Physical Review E* **90**, 032208 (2014). DOI: 10.1103/PhysRevE.90.032208

CONFERENCE ORAL PRESENTATIONS/ABSTRACTS

- [5] **S. Birch**. Testing the Limits of Geomorphology. *Planetary Systems: A Synergistic View*; Oral Presentation, Quy Nhon, Vietnam, July 2015.
- [4] **S. Birch**, A. Hayes, W. Dietrich, M. Malaska, R. Kirk and A. Lucas. Geomorphology of Titan's Polar Regions. *AGU Fall Meeting*; Poster, San Francisco, CA, December 2014.
- [3] R.M.C Lopes, M.J. Malaska, A.M. Schoenfeld, **S.P.D. Birch**, A. Hayes, A. Solomonidou and the Cassini RADAR Team. Geomorphic Units on Titan. *AGU Fall Meeting*; Poster, San Francisco, CA, December 2014.

- [2] R.M.C. Lopes, M. Malaska, A. LeGall, A. Hayes, **S.P.D. Birch**, K.L. Mitchell, R. Kirk, J. Radebaugh, C. Neish, A. Lucas, E. Stofan, M. Janssen, S. Wall, R. Lorenz, J. Lunine, and the Cassini RADAR Team. Titan's "blandlands": Are they massive sand sheets? *AGU Fall Meeting*; Poster, San Francisco, CA, December 2013.
- [1] **S. Birch**, M. Manga, B. Delbridge, A. Patel, E. Knappe, and J. Dufek. Scaling Laws for Impacts into Wet Substrates, Applied to the Bomb Sag at Home Plate, Mars. *AGU Fall Meeting*; Poster, San Francisco, CA, December 2013.

ADVISING

Undergraduate:

- Harry Tang; Cornell; 04/2015-Present
 - o Surface Processes on Comet 67P Churyumov/Gerasimenko

High School:

- Leslie Young; Ithaca High School; New Visions Program; 11/2014 – Present
 - o Hydraulic Mapping on Titan.

TECHNICAL SKILLS

- Proficient in Matlab, LaTeX, ArcGIS, AutoCAD, Google Earth, Microsoft Office Products and Adobe Suite Products

REFERENCES

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| <ul style="list-style-type: none"> - Dr. Alexander Hayes, Cornell University
Relationship: Primary Graduate Advisor
Email: hayes@astro.cornell.edu - Professor Michael Manga, University of California Berkeley
Relationship: Undergraduate Advisor
Email: hayes@astro.cornell.edu - Dr. Rosaly Lopes, Jet Propulsion Lab, California Institute of Technology
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Email: rosaly.m.lopes-gautier@jpl.nasa.gov - Dr. Michael Malaska, Jet Propulsion Lab, California Institute of Technology
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Email: Michael.J.Malaska@jpl.nasa.gov | <ul style="list-style-type: none"> - Professor Steven Squyres, Cornell University
Relationship: Graduate Committee member
Email: squyres@astro.cornell.edu - Professor Matthew Pritchard, Cornell University
Relationship: Graduate Committee member
Email: pritchard@cornell.edu - Additional References Available Upon Request |
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