

Dr. Colin M. Dundas — Curriculum Vitae

Contact Information

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Current Position

Research Associate, University of Arizona, August 2009-present

Education

The University of Arizona, Tucson, AZ
Ph.D., Planetary Science (Geoscience minor), 2009
Dissertation: Investigations of the Martian Mid-Latitudes: Implications for Ground Ice
Advisor: Professor Alfred McEwen
California Institute of Technology, Pasadena, CA
B.S. with honors, Planetary Science, 2004

Professional Experience

Graduate Research Assistant/Associate, University of Arizona, January 2005-August 2009
Graduate Teaching Assistant, University of Arizona, August 2004-May 2005

Research Interests

My primary research interests are planetary geomorphology and surface processes, particularly those involving ices. I seek to understand the physical processes that produce various landforms and how those processes scale with conditions on different planetary bodies, using a combination of modeling and observations from spacecraft. My specific areas of interest include periglacial and volcanic features and processes. Much of my work focuses on Mars, where there are many landforms with terrestrial analogues that allow a better understanding of the fundamental mechanisms.

Awards and Fellowships

Career Development Award, Lunar and Planetary Institute, 2009
Galileo Circle Scholarship, University of Arizona, 2005, 2008 and 2009
TRIF Imaging Fellowship, University of Arizona, 2007/08 (Competitive award, paid 50% of academic year salary)
Summer Undergraduate Research Fellowship, California Institute of Technology, 2003

Professional Activities

Manuscript reviewer for *Icarus*
Seminars and colloquia: Planetary Science Institute, Nov. 4, 2009
Member of: Geological Society of America (Planetary Geology Division)
American Geophysical Union

Additional Experience

Co-leader of a three-day PtyS 554 (Planetary Surfaces) class fieldtrip to Meteor Crater and the San Francisco Volcanic Field, April 2007 (13 students)
 Wrote captions for weekly HiRISE camera public image releases during Primary Science Phase
 Organized department graduate student Journal Club talks, 2006/07
 Participated in the NASA Planetary Volcanology Field Workshop, August 2005

Publications

Peer-Reviewed Papers

- Dundas, C. M.**, Byrne, S. Modeling sublimation of ice exposed by new impacts in the Martian mid-latitudes. *Icarus*, in press.
- Keszthelyi, L. P., Jaeger, W. L., **Dundas, C. M.**, Martinez-Alonso, S., McEwen, A. S., Milazzo, M. P. Hydrovolcanic features on Mars: Preliminary observations from the first Mars year of HiRISE imaging. *Icarus*, in press.
- Dundas, C. M.**, McEwen, A. S. An assessment of evidence for pingos on Mars using HiRISE. *Icarus*, in press.
- McEwen, A. S., et al. (68 coauthors in alphabetical order). The High Resolution Imaging Science Experiment (HiRISE) during MRO's Primary Science Phase (PSP). *Icarus*, in press.
- Byrne, S., **Dundas, C. M.**, et al., 2009. Distribution of mid-latitude ground ice on Mars from new impact craters. *Science* 325, 1674-1676.
- Lefort, A., Russell, P. S., Thomas, N., McEwen, A. S., **Dundas, C. M.**, Kirk, R. L., 2009. HiRISE observations of periglacial landforms in Utopia Planitia. *J. Geophys. Res.* 114, E04005, doi: 10.1029/2008JE003264.
- Keszthelyi, L., Jaeger, W., McEwen, A., Tornabene, L., Beyer, R. A., **Dundas, C.**, Milazzo, M., 2008. High Resolution Imaging Science Experiment (HiRISE) images of volcanic terrains from the first 6 months of the Mars Reconnaissance Orbiter Primary Science Phase. *J. Geophys. Res.* 113, E04005, doi: 10.1029/2007JE002968.
- Dundas, C. M.**, Mellon, M. T., McEwen, A. S., Lefort, A., Keszthelyi, L. P., Thomas, N., 2008. HiRISE observations of fractured mounds: Possible Martian pingos. *Geophys. Res. Lett.* 35, L04201, doi: 10.1029/2007GL031798.
- McEwen, A. S., et al. (29th of 32 coauthors), 2007. A closer look at water-related geologic activity on Mars. *Science* 317, 1706-1709.
- Jaeger, W. L., Keszthelyi, L. P., McEwen, A. S., **Dundas, C. M.**, Russell, P. S., 2007. Athabasca Valles, Mars: A lava-draped channel system. *Science* 317, 1709-1711.
- Dundas, C. M.**, McEwen, A. S., 2007. Rays and secondary craters of Tycho. *Icarus* 186, 31-40.

Papers in Preparation

- Dundas, C. M.**, McEwen, A. S., Diniega, S., Byrne, S. New and recent gully activity on Mars as seen by HiRISE. *Geophys. Res. Lett.*, submitted.
- Diniega, S., Byrne, S., Bridges, N. T., **Dundas, C. M.**, McEwen, A. Active evolution of Martian S. hemisphere dune gullies. *Geophys. Res. Lett.*, submitted.
- Banks, M. E., Galla, K., Byrne, S., McEwen, A. S., Bray, V. J., Fishbaugh, K. E., Herkenhoff, K. E., Murray, B. C., **Dundas, C. M.**, and the HiRISE Team. Crater

population and resurfacing of the Martian North Polar Layered Deposits. *J. Geophys. Res.*, submitted.

Reufer, A., Thomas, N., Benz, W., Byrne, S., Bray, V., **Dundas, C.**, Searls, M. Models of high velocity impacts into dust-covered ice: Application to Martian northern lowlands. *Planet. Space Sci.*, in preparation.

Comments and Replies

Jaeger, W. L., Keszthelyi, L. P., McEwen, A. S., Titus, T. N., **Dundas, C. M.**, Russell, P. S., 2008. Reply to comment on “Athabasca Valles, Mars: A lava-draped channel system.” *Science* 320, 1588, doi: 10.1126/science.1155124.

Conference Abstracts

Diniega, S., **Dundas, C. M.**, Byrne, S., McEwen, A., 2009. Active evolution of Martian S. hemisphere dune gullies. AGU Fall Meeting, Abstract #NNNN.

Dundas, C. M., McEwen, A. S., Diniega, S., Byrne, S., 2009. New and recent gully activity on Mars. AGU Fall Meeting, Abstract #NNNN.

Wray, J. J., Milliken, R. E., Swayze, G. A., Ehlmann, B. L., **Dundas, C. M.**, Baldrige, A. M., Andrews-Hanna, J. C., Murchie, S. L., 2009. Evaporites in Martian paleolakes: Observations and implications. AGU Fall Meeting, Abstract #NNNN.

Byrne, S., **Dundas, C. M.**, 8 coauthors, 2009. Distribution and nature of mid-latitude ground ice on Mars. GSA Annual Meeting, Abstract #20-15.

Dundas, C. M., Byrne, S., 2009. Modelling sublimation of impact-exposed ice in the Martian mid-latitudes: Implications for ground ice properties. EPSC 4, Abstract #503.

Reufer, A., Benz, W., Byrne, S., Searls, M., Thomas, N., Bray, V., McEwen, A., **Dundas, C.**, 2009. Modeling of ice-filled craters at mid-northern latitudes on Mars. EGU General Assembly, Abstract #9059.

Dundas, C. M., Byrne, S., McEwen, A. S., HiRISE Team, 2009. Modeling sublimation of ice exposed by recent impacts in the Martian mid-latitudes. LPSC 40, Abstract #2168.

Byrne, S., **Dundas, C. M.**, 17 coauthors, 2009. Excavation of subsurface ice on Mars by new impact craters. LPSC 40, Abstract #1831.

Wray, J. J., Milliken, R. E., Swayze, G. A., Dundas, C. M., Bishop, J. L., Murchie, S. L., Seelos, F. P., Squyres, S. W., 2009. Columbus Crater and other possible paleolakes in Terra Sirenum, Mars. LPSC 40, Abstract #1896.

Dundas, C. M., McEwen, A. S., 2008. Observational and theoretical assessment of possible pingos on Mars. AGU Fall Meeting, Abstract #P33B-1445.

Wray, J. J., Milliken, R. E., Murchie, S. L., Swayze, G. A., **Dundas, C. M.**, Seelos, F. P., Squyres, S. W., 2008. Clays and sulfates in a potential lacustrine evaporite sequence at Columbus Crater, Mars. AGU Fall Meeting, Abstract #P53B-1446.

Dundas, C. M., McEwen, A. S., 2008. HiRISE observations of fractured mounds in the Martian mid-latitudes. Ninth International Conference on Permafrost, Abstract #263.

Dundas, C. M., McEwen, A. S., HiRISE Team, 2008. Distribution and morphology of Martian fractured mounds. LPSC 39, Abstract #2044.

Dundas, C. M., Mellon, M. T., McEwen, A. S., Lefort, A., Keszthelyi, L. P., Thomas, N., HiRISE Team, 2007. HiRISE observations of Martian mid-latitude fractured mounds. AGU Fall Meeting, Abstract #P24A-03.

- Jaeger, W., Keszthelyi, L., McEwen, A., **Dundas, C. M.**, Russell, P. S., 2007. Early HiRISE observations of Athabasca Valles, Mars: A volcanic landscape. GSA Annual Meeting, Abstract #197-5.
- Keszthelyi, L., Jaeger, W., McEwen, A., Tornabene, L., Beyer, R., **Dundas, C.**, Milazzo, M., 2007. The first year of studying Mars volcanism with HiRISE. GSA Annual Meeting, Abstract #197-4.
- Dundas, C. M.**, Mellon, M. T., Lefort, A., Thomas, N., Keszthelyi, L. P., McEwen, A. S., HiRISE Team, 2007. HiRISE observations of fractured mounds: Possible Martian pingos. 7th Mars Conference, Abstract #3214.
- Jaeger, W. L., Keszthelyi, L. P., McEwen, A. S., **Dundas, C. M.**, Russell, P. S., 2007. The recent geologic history of Athabasca Valles, Mars, as revealed by HiRISE. 7th Mars Conference, Abstract #3394.
- Dundas, C. M.**, Keszthelyi, L. P., McEwen, A. S., HiRISE Team, 2007. Initial HiRISE observations of cratered cone groups on Mars. LPSC 38, Abstract #2116.
- Dundas, C. M.**, Okubo, C., McEwen, A. S., HiRISE Team, 2007. Early HiRISE observations of fractured mounds. LPSC 38, Abstract #2173.
- Jaeger, W. L., Keszthelyi, L. P., McEwen, A. S., **Dundas, C. M.**, Russell, P. S., HiRISE Team, 2007. Early HiRISE observations of ring/mound landforms in Athabasca Valles, Mars. LPSC 38, Abstract #1955.
- Keszthelyi, L., Jaeger, W. L., McEwen, A., **Dundas, C.**, HiRISE Team, 2007. Early HiRISE imaging of volcanic terrains. LPSC 38, Abstract #1978.
- Weitz, C. M., McEwen, A. S., Okubo, C. H., Russell, P., Grant, J. A., **Dundas, C.**, Bridges, N., HiRISE Team, 2007. Early HiRISE observations of light-toned layered deposits. LPSC 38, Abstract #1442.
- Dundas, C. M.**, McEwen, A. S., 2005. Secondary craters and rays of Tycho. GSA Annual Meeting, Abstract #94541.
- Murray, B., Byrne, S., Marsden, P., **Dundas, C.**, 2004. Implications of the anomalous cratering record of the South Layered Deposits. AGU Fall Meeting, Abstract #P41A-0889.
- Shen, A. H., **Dundas, C. M.**, Ahrens, T. J., Beauchamp, J. L., 2002. Chemical speciation in laser-desorption and impact-induced vapor in minerals. AGU Fall Meeting, Abstract #P22B-0407.