

Michael J. Malaska, Ph. D.
Jet Propulsion Laboratory, California Institute of Technology
4800 Oak Grove Dr., MS 183-301
Pasadena, CA 91109-8099
818-354-7652
Michael.J.Malaska@jpl.nasa.gov

OBJECTIVE

Highly creative and enthusiastic individual with a broad background in planetary science, chemistry, and geology with a research program in planetary science at the interface of the sciences of geology, chemistry, and astrobiology with specific skills encompassing field science, laboratory research, and remote sensing.

EDUCATION

NASA/Jet Propulsion Laboratory, California Institute of Technology, NPP Senior Postdoctoral Fellow, 2012-2015

Mayo Clinic Jacksonville, postdoctoral position in Neurochemistry, 1991-1993.

University of California, Berkeley, Ph.D. in Chemistry, 1991.

Massachusetts Institute of Technology, S.B. in Chemistry, 1986.

RESEARCH SUMMARY

My planetary geology research program has focused on the interface of chemical and geological processes on Saturn's moon Titan based on data returned by the Cassini-Huygens spacecraft. These studies examine how liquid hydrocarbon rains and rivers on that world have eroded and dissolved a landscape made of organic materials layered upon rock-hard water ice. My key discoveries include the identification and characterization of labyrinth terrain on Titan, comparison of meandering channels to high-volume rivers on Earth, and the modelling of dissolution processes of Titan surface materials. My current program involves laboratory studies examining the dissolution geology of Titan and the geomorphological mapping of Titan's surface.

My 20 year career as an organic chemist in drug discovery was located at the interface of chemistry and biology. This research has discovered new chemical compounds that can interact with enzymes and receptors to control cellular processes and treat diseases. I was responsible for leading research teams consisting of chemists, biologists, biochemists, molecular biologists, and experts in pharmacokinetics. Research projects I have led investigated areas that included: glaucoma, parasitic vector control, metabolic disease, rheumatoid arthritis, cancer, and visceral leishmaniasis. The overarching theme in all my medicinal chemistry research was exploring and exploiting the ways that organic molecules are recognized by biological structures for intracellular communication and cellular control.

PROFESSIONAL EXPERIENCE

NASA / Jet Propulsion Laboratory, California Institute of Technology
Pasadena, CA

July 2016 – present

Scientist III in Planetary Ices group

- Associate of the Cassini RADAR Science Team.
- Laboratory investigations examining the properties of Titan's hydrocarbon lakes at cryogenic temperatures.
- Geomorphological mapping of Titan's surface
- Development of down-borehole UV-Raman instrument for microbial habitat characterization in glacial ice.
- Understanding the geomorphology and evolution of Titan's labyrinthic terrains

Michael J. Malaska, Ph.D.

NASA / Jet Propulsion Laboratory, California Institute of Technology

July 2015 – present

Pasadena, CA

Technologist III in Planetary Ices group

- Associate of the Cassini RADAR Science Team.
- Laboratory investigations examining the solubilities of organic materials in Titan's hydrocarbon lakes at cryogenic temperatures.
- Geomorphological mapping of Titan's surface

NASA / Jet Propulsion Laboratory, California Institute of Technology

October 2012 – July 2015

Pasadena, CA

Senior NASA Postdoctoral Program Fellow

- Associate of the Cassini RADAR Science Team.
- Laboratory investigations examining the solubilities of organic materials in Titan's hydrocarbon lakes at cryogenic temperatures.
- Investigations and mapping of dissolution terrains on Titan's surface.
- Volunteer with the JPL Speaker's Bureau presenting results from JPL missions and research to museums, schools, libraries, and community groups.

Volunteer field scientist with the North Carolina State Geological Survey

March 2012 – August 2012

Chatham County, NC

Volunteer field scientist

- Gained experience in field research. Aided in the identification and characterization of rock samples and outcrops in northern Chatham county with North Carolina state geologists.
- Field work involved backcountry hiking and navigation through woods and along streambeds with sample identification along the selected traverse route.
- Data collected included: location, rock type, rock features, strike and dip of foliations, joints, and bedding.
- Individually responsible for the initial sample collection, identification, and mapping for SE shore of Jordan Lake, North Carolina. Localized key contacts between volcanic and Triassic sedimentary rock units.

Scynexis, Inc.

July 2007 – January 2012

Research Triangle Park, NC

Manager, Medicinal Chemistry Department

- Led and coordinated chemistry efforts to develop compounds as visceral leishmaniasis therapeutics in collaboration with the Drugs for Neglected Diseases initiative (DNDi) with a team of scientists at SCYNEXIS (3 scientists) and at WuXi App Tec (5 scientists).
- Project Leader in Lead Optimization - developed compounds for oncology research in collaboration with Merck and Co. Achieved pre-clinical milestone.
- Managed an offsite research laboratory with two laboratories and 9 scientists.
- Member of the Safety Committee during the application process for the Carolina STAR program.

Scynexis, Inc.

July 2000 – July 2007

Research Triangle Park, NC

Research Investigator, Medicinal Chemistry Department

- Project Leader in Lead Optimization - developed kinase inhibitors in collaboration with Teijin Pharma.
- Project Leader in Lead Optimization - optimized a complex natural product skeleton for ophthalmic use in collaboration with Merck and Co.
- Project Leader in Lead Generation Project - responsible for the production and delivery of 100,000 molecules/year using automated technology.
- Coordinated development and production of combinatorial libraries in RTP (NC), Ongar (England), and Novosibirsk (Russia) involving a total of 23 chemists.

Rhône-Poulenc Ag Company/Aventis CropScience

October 1998 – June 2000

Research Triangle Park, NC

Section Head, Discovery Chemistry

- Responsible for program to find a new endectocidal molecule for animal health in collaboration with Merial.
- Prepared candidate molecules for ectoparasite control for animals.

Michael J. Malaska, Ph.D.

- Synthesized compounds and rapidly explored and evaluated the potential of lead molecules for insecticidal use and for control of animal parasites.
- Incorporated and implanted new technologies and automation tools for high throughput synthesis such as IRORI solid phase combinatorial chemistry technology and ChemSpeed robotic synthesizer.

Rhône-Poulenc Secteur Agro

June 1995 – September 1998

Lyon, France

Ingenieur de Recherche, Chimie Combinatoire

- Coordinated the development of combinatorial libraries of insecticidally active molecules for both lead generation and optimization.
- Developed solid phase chemical routes that produced over 20,000 molecules.
- Coordinated transfer of solid phase chemistry and high throughput synthesis tools to the American research facility.

Rhône-Poulenc Ag Company

November 1993 – May 1995

Research Triangle Park, NC

Associate Scientist

- Synthesized novel proprietary insecticidal compounds active at the insect GABA receptor.
- Prepared molecules for agricultural field trials.

Mayo Clinic Jacksonville

January 1992 – October 1993

Jacksonville, FL

Research Fellow

- Postdoctoral research in neurochemistry supervised by Dr. Alan P. Kozikowski.
- Designed and prepared high affinity ligands for muscarinic receptors as potential therapeutics for Alzheimer's Disease.
- Determined the structure-activity relationships of the M₂-selective antagonist himbacine.
- Synthesized and evaluated derivatives of *myo*-inositol as anticancer agents and tools for examining the inositol second messenger biochemical pathway.

University of California, Berkeley/Lawrence Berkeley Laboratory

August 1986 – December 1991

Berkeley, CA

Research Assistant

- Graduate research in organic chemistry under the direction of Professor K. Peter C. Vollhardt.
- Developed a new route to morphine alkaloids using a cobalt-mediated [2+2+2]cycloaddition.
- Executed mechanistic studies that discovered novel rearrangements of thiophene ring systems.

Biogen Research Corporation

June 1985 – August 1985,

Cambridge, MA

January 1986

Research Assistant (student intern)

- Synthesized peptides using both manual and automated solid-phase techniques.

PUBLICATIONS

Accepted for publication

Hayes, A.G., Birch, S.P.D., Dietrich, W.E., Howard, A.D., Kirk, R.L., Poggiali, V., Mastroguiseppe, M., Michaelides, R.J., Corlies, P.M., Moore, J.M., **Malaska, M.J.**, Mitchell, K.L., Lorenz, R.D., in press. Topographic constraints on the evolution and connectivity of Titan's lacustrine basins. *Geophysical Research Letters* 44, in press. doi: 10.1002/2017GL075468

In press:

Neish, C., Lorenz, R., Turtle, E., Barnes, J., Trainer, M., Stiles, B., Kirk, R., Hibbitts, C., **Malaska, M.**, accepted. Strategies for detecting biological molecules on Titan. Accepted for publication in *Astrobiology*.

Michael J. Malaska, Ph.D.

Published.

Maynard-Casely, H., Cable, M., Vu, T., **Malaska, M.**, Choukroun, M., Hodyss, R., in press. Prospects for mineralogy on Titan. *American Mineralogist*. In press. doi: 10.2138/am-2018-6259.

Mastrogiuseppe, M., Hayes, A., Poggiali, V., Lunine, J., Lorenz, R., Seu, R., Le Gall, A., Notarnicola, C., Mitchell, K., **Malaska, M.**, Birch, S.P.D., 2018. Bathymetry and composition of Titan's Ontario Lacus derived from Monte Carlo-based waveform inversion of Cassini RADAR altimetry data. *Icarus* 300, 203-209. doi: 10.1016/j.icarus.2017.09.009.

Méndez-Harper, J., McDonald, G.D., Dufek, J., **Malaska, M.J.**, Burr, D.M., Hayes, A.G., McAdams, J., Wray, J.J. (2017). The Electrified Sands of Titan. *Nature Geoscience* 10, 260-265. doi:10.1038/ngeo2921.

Malaska, M.J., Hodyss, R., Lunine, J.I., Hayes, A.G., Hofgartner, J.D., Hollyday, G., Lorenz, R.D., 2017. Laboratory measurements of nitrogen dissolution in Titan lake fluids. *Icarus*, 289, 94-105. doi: 10.1016/j.icarus.2017.01.033.

Birch, S.P.D., Hayes, A.G., Dietrich, W.E., Howard, A.D., Bristow, C.S., **Malaska, M.J.**, Moore, J.M., Mastrogiuseppe, M., Hofgartner, J.D., Williams, D.A., White, O.L., Soderblom, J.M., Barnes, J.W., Turtle, E.P., Lunine, J.I., Wood, C.A., Neish, C.D., Kirk, R.L., Stofan, E.R., Lorenz, R.D., Lopes, R.M.C., 2017. Geomorphologic mapping of Titan's polar terrains: Constraining surface processes and landscape evolution. *Icarus* 282, 214-236. doi: 10.1016/j.icarus.2016.08.003.

Le Gall, A., **Malaska, M.J.**, Lorenz, R.D., Janssen, M.A., Tokano, T., Hayes, A.G., Mastrogiuseppe, M., Lunine, J.I., Veysière, G., Encrenaz, P., Karatekin, O., 2016. Composition, seasonal change, and bathymetry of Ligeia Mare, Titan derived from microwave thermal emission. *Journal of Geophysical Research: Planets* 121, 233-251. doi: 10.1002/2015JE004920.

Hofgartner, J.D., Hayes, A.G., Lunine, J.I., Zebker, H., Lorenz, R.D., **Malaska, M.J.**, Mastrogiuseppe, M., Notarnicola, C., Soderblom, J.M., 2016. Titan's "Magic Islands": Transient features in a hydrocarbon sea. *Icarus* 271, 338-349. doi:10.1016/j.icarus.2016.02.022.

Malaska, M.J., Lopes, R.M.C., Williams, D.A., Neish, C.D., Solominidou, A., Soderblom, J.M., Schoenfeld, A.M., Birch, S.P.D., Hayes, A.G., Le Gall, A., Janssen, M.A., Farr, T.G., Lorenz, R.D., Radebaugh, J., Turtle, E.P., 2016. Geomorphological map of the Afekan Crater region, Titan: Terrain relationships in the equatorial and mid-latitude regions. *Icarus* 270, 130-161. doi: 10.1016/j.icarus.2016.02.021.

Malaska, M.J., Lopes, R.M., Hayes, A.G., Radebaugh, J., Lorenz, R.D., Turtle, E.P., 2016. Material transport map of Titan: the fate of dunes. *Icarus* 270, 183-196. doi: 10.1016/j.icarus.2015.09.029.

Bonnefoy, L.E., Hayes, A.G., Hayne, P.O., **Malaska, M.J.**, Le Gall, A., Solomonidou, A., Lucas, A., 2016. Compositional and spatial variations in Titan dune and interdune regions from Cassini VIMS and RADAR. *Icarus* 270, 222-237. doi: 10.1016/j.icarus.2015.09.014.

Janssen, M.A., Le Gall, A., Malaska, M.J., Lopes, R.M., Lorenz, R.D., **Malaska, M.J.**, Hayes, A.G., Neish, C.D., Solomonidou, A., Mitchell, K.L., Radebaugh, J., Keihm, S.J., Choukroun, M., Leyrat, C., Encrenaz, P.J., Mastrogiuseppe, M., 2016. Titan's Surface at 2.218-cm Wavelength wavelength imaged by the Cassini RADAR radiometer: Results and interpretation through the first ten years of observations. *Icarus* 270, 443-459. doi: 10.1016/j.icarus.2015.09.027.

Lopes, R.M.C., **Malaska, M.J.**, Solomonidou, A., Le Gall, A., Janssen, M.A., Neish, C.D., Turtle, E.P., Birch, S.P.D., Hayes, A.G., Radebaugh, J., Coustenis, A., Schoenfeld, A., Stiles, B.W., Kirk, R.L., Mitchell, K.L., Stofan, E.R., Lawrence, K.J. and the Cassini RADAR Team, 2016. Nature, distribution, and origin of Titan's Undifferentiated Plains. *Icarus* 270, 162-182. doi: 10.1016/j.icarus.2015.11.034.

Michaelides, R.M., Hayes, A.G., Mastrogiuseppe, M., Zebker, H.A., Farr, T.G., **Malaska, M.J.**, Poggiali, V., Mullen, J.P., 2016. Constraining the physical properties of Titan's empty lake basins using nadir and off-nadir Cassini RADAR backscatter. *Icarus* 270, 57-66. doi:10.1016/j.icarus.2015.09.043.

Radebaugh, J., Ventra, D., Lorenz, R.D., Farr, T., Kirk, R., Hayes, A., **Malaska, M.J.**, Birch, S., Liu, Z. Y-C., Lunine, J., Barnes, J., Le Gall, A., Lopes, R., Stofan, E., Wall, S., Paillou, P., 2016. Alluvial and fluvial fans on Saturn's moon Titan reveal processes, materials and regional geology. In, Ventra, D. & Clarke, L. E. (eds) *Geology and*

Michael J. Malaska, Ph.D.

Geomorphology of Alluvial and Fluvial Fans: Terrestrial and Planetary Perspectives. Geological Society, London, Special Publications, 440. doi: 10.1144/SP440.6.

Neish, C.D., Barnes, J.W., Sotin, C., MacKenzie, S., Soderblom, J.M., Le Mouélic, S., Kirk, R.L., Stiles, B.W., **Malaska, M.J.**, Le Gall, A., Brown, R.H., Baines, K.H., Buratti, B., Clark, R.N., Nicholson, P.D., 2015. Spectral properties of Titan's impact craters imply chemical weathering of its surface. *Geophysical Research Letters* 42, 3746–3754. doi: 10.1002/2015GL063824.

Malaska, M.J. and Hodyss, R., 2014. Dissolution of benzene, naphthalene, and biphenyl in a simulated Titan lake. *Icarus* 242, 74-81. doi: 10.1016/j.icarus.2014.07.022.

Hofgartner, J.D., Hayes, A.G., Lunine, J.I., Zebker, H., Stiles, B.W., Sotin, C., Barnes, J.W., Turtle, E.P., Baines, K.H., Brown, R.H., Buratti, B.J., Clark, R.N., Encrenaz, P., Kirk, R.D., Le Gall, A., Lopes, R.M., Lorenz, R.D., **Malaska, M.**, Mitchell, K.L., Nicholson, P.D., Paillou, P., Radebaugh, J., Wall, S.D., Wood, C., 2014. Transient features in a Titan sea. *Nature Geoscience* 7, 493–496. doi: 10.1038/ngeo2190.

Lorenz, R.D., Kirk, R.L., Hayes, A.G., Anderson, Y.Z., Lunine, J.I., Tokano, T., Turtle, E.P., **Malaska, M.J.**, Soderblom, J.M., Lucas, A., Karatekin, Ö., Wall, S.D., 2014. A radar map of Titan Seas: Tidal dissipation and ocean mixing through the throat of Kraken. *Icarus* 237, 9-15. doi: 10.1016/j.icarus.2014.04.005.

Cable, M.L., Vu, T.H., Hodyss, R., Choukroun, M., **Malaska, M.**, Beauchamp, P., 2014. Experimental determination of kinetics of formation of benzene-ethane co-crystals and implications for Titan. *Geophysical Research Letters* 41, 5396-5401. doi: 10.1002/2014GL060531.

Alibay, F., Fernandes, P., McGranaghan, R., Leonard, J., Clegg, Craig, P., Day, M., Fougère, N., Girazian, Z., Hosseini, S., Hutchins, M., Scully, J., Uckert, K., **Malaska, M.**, Pathoff, A., Ries, P., Budney, C., Mitchell, K., 2014. Design of a High-value, Low-cost Mission to the Neptunian System. *IEEE Aerospace Conference 2014*, 1-19. doi: 10.1109/AERO.2014.6836294.

Lopes, R.M.C., Kirk, R.L., Mitchell, K.L., LeGall, A., Barnes, J.W., Hayes, A., Kargel, J., Wye, L., Radebaugh, J., Stofan, E.R., Janssen, M., Neish, C., Wall, Wood, C.A., Lunine, J.I., **Malaska, M.J.**, 2013. Cryovolcanism on Titan: New results from Cassini RADAR and VIMS. *Journal of Geophysical Research: Planets*, 118, 1-20. doi: 10.1002/jgre.20062.

Barnes, J.W., Buratti, B.J., Turtle, E.P., Bow, J., Dalba, P.A., Perry, J., Brown, R.H., Rodriguez, S., Le Mouélic, S., Baines, K.H., Sotin, C., Lorenz, R.D., **Malaska, M.J.**, McCord, T.B., Clark, R.N., Jaumann, R., Hayne, P., Nicholson, P.D., Soderblom, J.M., Soderblom, L.A., 2013. Precipitation-Induced Surface Brightenings Seen on Titan by Cassini VIMS and ISS. *Planetary Science* 2, 1. doi: 10.1186/2191-2521-2-1.

Bradley, P.J., Hanna, H.D. and **Malaska, M.J.**, 2012. Geologic map of the northwest portion of the Merry Oaks 7.5-minute quadrangle, Chatham and Lee Counties, North Carolina: North Carolina Geological Survey Open-file Report 2012-02, scale 1:24,000, in color.

Barnes, J.W., Lemke, L., Foch, R., McKay, C.P., Beyer, R.A., Radebaugh, J., Atkinson, D.H., Lorenz, R.D., Le Mouélic, S., Rodriguez, S., Gundlach, J., Giannini, F., Bain, S., Flasar, F.M., Hurford, T., Anderson, C.M., Merrison, J., Ádámkóvics, M., Kattenhorn, S.A., Mitchell, J., Burr, D.M., Colaprete, A., Schaller, E., Friedson, A.J., Edgett, K.S., Coradini, A., Adriani, A., Sayanagi, K., **Malaska, M.J.**, Morabito, D., Reh, K., 2012. AVIATR – Aerial Vehicle for In-situ and Airborne Titan Reconnaissance. *Experimental Astronomy* 33, 55-127. doi: 10.1007/s10686-011-9275-9.

Pérez, D., Siesel, B.A., **Malaska, M.J.**, David, E., Vollhardt, K.P.C., 2000. Stereoselective [2+2+2]Cycloadditions to the Benzofuran Nucleus: A Novel Strategy towards the Synthesis of Morphinoids. *Synlett* 3, 306-310.

Malaska, M.J., Fauq, A.H., Kozikowski, A.P., Aagaard, P.J., McKinney, M., 1995. Chemical Modification of Ring C of Himbacine: Discovery of a Pharmacophoric Element for M₂-Selectivity. *Bioorganic and Medicinal Chemistry Letters* 5, 61-66.

Boese, R., Harvey, D.F., **Malaska, M.J.**, Vollhardt, K.P.C., 1994. [2+2+2]Cycloadditions of Alkynes to Furans and Thiophenes: A Cobalt-Mediated 'Enol Ether Walk'. *Journal of the American Chemical Society* 116, 11153-11154.

Michael J. Malaska, Ph.D.

Kozikowski, A.P., Fauq, A.H., **Malaska, M.J.**, Tuckmantel, W., Ognyanov, V.I., Powis, G., 1994. Inositol Analogs as Potential Anticancer Therapeutics. *Current Medicinal Chemistry* 1, 1-12.

Malaska, M.J., Fauq, A.H., Kozikowski, A.P., Aagaard, P.J., McKinney, M., 1993. Simplified Analogs of Himbacine Displaying Potent Binding Affinity for Muscarinic Receptors. *Bioorganic and Medicinal Chemistry Letters*. 3, 1247-1252.

Malaska, M.J., Vollhardt, K.P.C. "Organic Transformations Involving Organocobalt: Mechanisms and Synthesis". In *Advances in Natural Product Chemistry*; Atta-ur Rahman, Ed.; Proceedings of the Fifth International Symposium and Pakistan - US Binational Workshop on Natural Product Chemistry, Karachi, Pakistan, 1992; Harwood Academic: Philadelphia, 1992; pp 53-63.

PATENTS

Fan, W., Haxell, T.F., Jenks, M.G., Kiwanishi, N., Lee, S., Liu, H., **Malaska, M.J.**, Moore, J.A. III, Ogino, Y., Onozaki, Y., Pandi, B., Peel, M.R., Sakamoto, T., Siu, T., 2010. Inhibitors of AKT activity. WO201004933, 424 pp.

Gogo, Y., Sagara, T., Fan, W., Haxell, T.F., Jenks, M.G., **Malaska, M.J.**, Moore, J.A. III, Ouvry, G., Pandi, B., Peel, M.R., Steward, K.M., 2010. Novel 6-azaindole aminopyrimidine derivatives having NIK inhibitory activity. WO2010042337, 132 pp.

Brnardic, E., Doherty, J.B., Dorsey, J.B., Ellwood, C., Fillmore, M., **Malaska, M.**, Nelson, K., Soukri, M., 2009. Preparation of indole diterpene alkaloids as Maxi-K channel blockers for the treatment of glaucoma. WO2009048559, 147 pp.

Brnardic, E., Doherty, J.B., Ellwood, C., Fillmore, M., **Malaska, M.**, 2010. Maxi-K channel blockers and methods of use. WO2009048558, 39 pp.

Chou, D.T., Knauf, W., Maier, M., **Malaska, M.J.**, McIntyre, D., Lochhaas, F., Huber, S.K., 2007. Preparation of 1-Arylpyrrol amine derivatives as pesticidal agents. US 2007281976, 22 pp.

Chou, D.T., Knauf, W., Maier, M., **Malaska, M.J.**, McIntyre, D., Lochhaas, F., Huber, S.K., Seeger, K., 2006. Pesticidal agents on the basis of 1-Aryl-aminopyrrol. WO2006000315, 67 pp.

Huber, S.K., Ribeill, Y., McComb, S.M., **Malaska, M.J.**, Chou, D.T., Perez de Leon, A., 2003. Control of Arthropods in Animals. US6531501, 18 pp.

Chou, D.T., Huber, S.K., **Malaska, M.J.**, McComb, S.M., Perez de Leon, A., Ribeill, Y., 2000. Control of Arthropods in Animals. WO0035884, 62 pp.

INVITED TALKS

"Scientific expedition to an extremophile sulfide cave: a terrestrial analog for a European ocean" invited speaker at California Institute of Technology, Pasadena, CA, August 2017.

"Titan: An Earth-like world in the Outer Solar System" invited speaker at California Institute of Technology, Pasadena, CA, June 2017.

"Titan as an Earthlike world in the outer Solar System" invited speaker at University of Illinois, Chicago, IL, February 2017.

"Titan as an Earthlike world in the outer Solar System" invited speaker at University of Nebraska, Lincoln, NE, December 2015.

"Titan's Earthlike Landscape" invited speaker for Guilford Technical Community College Tri-Star event, Jamestown, NC, March 2011.

Michael J. Malaska, Ph.D.

"Design, Development, and Production of Ring-fused Isoindolones" North Carolina State University, Raleigh, NC, October 2002.

SCIENTIFIC CONFERENCES

Malaska, M.J., and Mitchell, K.L., 2017. Predicting cave formations in Saturn's moon Titan. Oral presentation at the Geological Society of America Annual Meeting, Seattle, WA, October, 2017. Abstract 189-6.

Malaska, M.J., Willis, M., Bhartia, R., Wanger, G., Priscu, J., Eshelman, E., Abbey, W., 2017. Poster presentation at the Geological Society of America Annual Meeting, Seattle, WA, October, 2017. Abstract 157-7.

Schoenfeld, A., Lopes, R., **Malaska, M.J.**, Solomonidou, A., 2017. Poster presentation at the Geological Society of America Annual Meeting, Seattle, WA, October, 2017. Abstract 178-3.

Malaska, M.J., Lopes, R.M.C., Mitchell, K.L., Radebaugh, J., Verlander, T., Schoenfeld, A., 2017. Mapping the Labyrinths of Titan. Oral presentation at the 3rd Planetary Data Workshop, Flagstaff, AZ, June 2017. Abstract 7115.

Malaska, M.J., Lopes, R.M.C., Radebaugh, J., Kerber, L., Solomonidou, A., 2017. What is the ultimate fate of tian's dune sands? Oral presentation at the Fifth International Planetary Dunes conference, St. George, UT, May 2017. Abstract 3021.

Lian, Y., Newman, C.E., McDonald, D., Richardson, M.L., **Malaska, M.J.**, 2017. The impact of surface properties and dune formation hypothesis on predicted dune transport and orientations in the Aeolis Research Titan GCMs. Oral presentation at the Fifth International Planetary Dunes conference, St. George, UT, May 2017. Abstract 3045.

Sotin, C., Hayes, A., **Malaska, M.**, McEwen, A., and Oceanus Team, 2017. Oceanus: a New Frontiers mission concept to address Titan's habitability. Oral presentation (by Malaska) at AbSciCon2017, Mesa, AZ, April 2017. Abstract 3523.

Hodyss, R., Piao, S., **Malaska, M.J.**, Cable, M., 2017. Carbon dioxide chemistry on the surface of Titan. Oral presentation (by Malaska) at AbSciCon2017, Mesa, AZ, April 2017. Abstract 3391.

Eshelman, E., Wanger, G., Willis, M., Carrier, B., Abbey, W., **Malaska, M.**, Beegle, L.W., DeFlores, L., Priscu, J., Lane, A.L., Mellerowicz, B., Kim, D., Paulsen, G., Zacny, K., Bhartia, R., 2017. WATSON: A wireline ultraviolet Raman and fluorescence spectrometer for subsurface organic detection in northern ice sheets. Oral presentation (by Eshelman) at AbSciCon2017, Mesa, AZ, April 2017. Abstract 3415.

Malaska, M.J., Lopes, R.M.C., Mitchell, K.L., Radebaugh, J., Verlander, T., Schoenfeld, A., 2017. Classification of Labyrinth Terrains on Titan. Oral presentation at the 48th Lunar and Planetary Science Conference, The Woodlands, TX, March 2017. Abstract 2406.

Hodyss, R., Piao, S., **Malaska, M.J.**, Cable, M., 2016. Carbon dioxide chemistry on the surface of Titan. Presented at the American Astronomical Society, Division of Planetary Sciences Annual Meeting 48, Pasadena, CA, October 2016. Abstract 425.07.

Malaska, M.J., Lopes, R.M.C., Schoenfeld, A., Birch, S., Hayes, A., Williams, D.A., Solomonidou, A., Jansen, M., Le Gall, A., Solderblom, J.M., Neish, C., Turtle, E.P., Cassini RADAR Team., 2016. Titan's global geologic processes. Presented at the American Astronomical Society, Division of Planetary Sciences Annual Meeting 48, Pasadena, CA, October 2016. Abstract 502.06.

Malaska, M.J., Hodyss, R.P., Nerenbeg, P., Miller, T., 2016. Laboratory studies of dissolution geology on Saturn's moon Titan. Oral presentation at the Geological Society of America Annual Meeting, Denver, CO, September, 2016. Abstract number 190-9

Michael J. Malaska, Ph.D.

Malaska, M.J., Lopes, R.M.C., Schoenfeld, A., Williams, D.A., Birch, S.B.D., Hayes, A.G., 2016. Geomorphologic map of the Afekan Crater region, Titan. Oral presentation at the Planetary Mappers Meeting, Flagstaff, AZ, June 2016.

Lorenz, R.D., Le Gall, A., Turtle, E.P., Mastrogiuseppe, M., Poggiali, V., Hayes, A.G., Janssen, M.A., **Malaska, M.J.**, Lopes, R., Callahan, P., Radebaugh, J., Barnes, J., Kirk, R., Stofan, E., 2016. The Edge of Xanadu: Investigation with Altimetry and Nadir Emissivity. Oral presentation at the 47th Lunar and Planetary Science Conference, The Woodlands, TX, March 2016. Abstract 1910.

Kerber, L., Nasnas, I., Ashley, J.W., **Malaska, M.J.**, Parcheta, C., Mitchell, K.L., Anderson, R.C., 2016. A concept for exploring the history of lunar mare deposits with the AXEL extreme terrain rover. Poster presented at the 47th Lunar and Planetary Science Conference, The Woodlands, TX, March 2016. Abstract 2969.

Malaska, M.J., Hodyss, R., Lunine, J.I., Hayes, A.G., Hofgartner, J., Hollyday, G., 2016. The dissolved nitrogen fluffiness of Titan lakes. Oral presentation at the 47th Lunar and Planetary Science Conference, The Woodlands, TX, March 2016. Abstract 1729.

Hayes, A.G., Mastrogiuseppe, M., Lunine, J.I., Poggiali, V., Lorenz, R.D., Mitchell, K.M., **Malaska, M.J.**, Le Gall, A., 2016. The bathymetry and composition of Titan's lakes and seas. Oral presentation at the 47th Lunar and Planetary Science Conference, The Woodlands, TX, March 2016. Abstract 1904.

Hodyss, R., Cable, M., Vu, T.H., **Malaska, M.J.**, 2016. Carbon dioxide chemistry on Titan's surface. Oral presentation at the 47th Lunar and Planetary Science Conference, The Woodlands, TX, March 2016. Abstract 2089.

Mitchell, K.L., Lunine, J.I., Barmatz, M.B., Jamieson, C.S., **Malaska, M.J.**, Lorenz, R.D., Mastrogiuseppe, M., Hayes, A.G., LeGall, A., Soderblom, J.M., Cassini RADAR Team, 2016. Towards and end-to-end model relating microwave observations to bulk chemistry of Titan's lakes and seas. Oral presentation at the 47th Lunar and Planetary Science Conference, The Woodlands, TX, March 2016. Abstract 2544.

Hollyday, G., **Malaska, M.J.**, Hodyss, R., Mitchell, K., Lunine, J.I., Hayes, A.G., Hofgartner, J., Lorenz, R., 2016. Fitting nitrogen solubility lab data for modeling Titan's lakes and seas. Poster presented at the 47th Lunar and Planetary Science Conference, The Woodlands, TX, March 2016. Abstract 2292.

Kerber, L., Mueller, R.P., Sibille, L., Abbud-Madrid, A., Bertrand, T., Stack, K.M., Nicholas, A.K., Parcheta, C.E., Piqueux, S., Daubar, I.J., **Malaska, M.J.**, Ashley, J.W., Diniega, S., Dickson, J.L., Fassett, C.I., 2016. A human landing site at Apollinaris Sulci: Life inside a yardang. Presented at the First Landing Site/Exploration Zone Workshop for Human Missions to the Surface of Mars (2015). Houston, TX. October 2015. Abstract 1043.

Malaska, M.J., Mitchell, K.L., Hodyss, R., Nerenberg, P.S., Hayes, A.G., 2016. Titan Karst. Oral presentation at the 2nd International Planetary Caves Conference (2015). Flagstaff, AZ. October 2015. Abstract 9024.

Kerber, L., Nesnas, I., Ashley, J.W., **Malaska, M.J.**, Parcheta, C., Mitchell, K.L., Anderson, R.C., 2015. Oral presentation at the 2nd International Planetary Caves Conference (2015). Flagstaff, AZ. October 2015. Abstract 9022.

Malaska, M.J., Kelly, H.S., Boston, P.J., Spilde, M., Rosales-Lagarde, L., 2015. Diverse chemical environments in an extremophile sulfide cave system: Terrestrial analogs for a European ocean. Presented orally at the Astrobiology Science Conference 2015, Chicago IL. April 2015. Abstract 7272.

Cable, M.L., Vu, T., H., **Malaska, M.J.**, Hodyss, R., 2015. Fiber optic probes for in situ determination of Titan Lake habitability. Presented orally at the Astrobiology Science Conference 2015, Chicago, IL. April 2015. Abstract 7409.

Hodyss, R., **Malaska, M.J.**, Cable, M., 2016. Carbamation: A new mechanism for the formation of oxygenated organics on Titan's surface. Poster presented at the Astrobiology Science Conference 2015, Chicago, IL. April 2015. Abstract 7071.

Cabrol, N.A., Grin, E.A., Smith, T., Lee, S.Y., Parro, V., Sobron, P., Rose, K., Moersch, J., Wettergreen, D.S., Smith, E.D., Demergasso, C., Echeverria, A., Chong, G., Aguilera, A., Blanco, Y., Lorenz, R., Stofan, E.R., Tilot, V., Bebout, L., Detweiler, A., Fong, T., Tambley, C., Thompson, C., **Malaska, M.J.**, 2015. Towards the adaptive

Michael J. Malaska, Ph.D.

exploration of lakes and seas on Titan. Presented orally at the Astrobiology Science Conference 2015, Chicago, IL, April 2015. Abstract 7017.

Malaska, M.J., Lopes, R.M., Hayes, A.G., Radebaugh, J., Lorenz, R., Barnes, J., Turtle, E., 2015. Material Flux on Titan: The fate of dune materials. Oral presentation at Lunar and Planetary Science Conference 46, The Woodlands, TX, March 2015. Abstract 3024.

Williams, D.A., **Malaska, M.J.**, Lopes, R.M.C., Radebaugh, J., Barnes, J.W., Turtle, E.P., Kirk, R., 2015. Geologic Mapping of the Adiri region of Titan. Poster presentation at Lunar and Planetary Science Conference 46, The Woodlands, TX, March 2015. Abstract 1127.

Cable, M.L., Vu, T.H., **Malaska, M.J.**, Hodyss, R., 2015. Fiber optic probes for in situ spectroscopy of Titan's lakes. Poster presentation at 46th Lunar and Planetary Science Conference, The Woodlands, TX, March 2015. Abstract 2638.

Hodyss, R., Vu, T.H, Cable, M.L., Maynard-Casey, H. Choukroun, M., **Malaska, M.J.**, Beauchamp, P., 2015. Benzene-based co-crystals on the surface of Titan. Oral presentation at 46th Lunar and Planetary Science Conference 46, The Woodlands, TX, March 2015. Abstract 2078.

Mendez-Harper, J.S., MacDonald, G.D., Dufek, J., Hayes, A.G., **Malaska, M.J.**, McAdams, J.S., Wilhelm, M.B., Wray, J.J., 2015. Triboelectric charging of Titan dune grains: Effects on sediment transport. Oral presentation at the Lunar and Planetary Science Conference, The Woodlands, TX, March 2015. Abstract 1637.

Michaelides, R.J., Hayes, A.G., Mastrogiuseppe, M., Zebker, H.A., Farr, T.G., **Malaska, M.J.**, Poggali, V., 2015. Titan's empty lake basins: constraining surface physical properties by investigating radar backscatter behavior at multiple incidence angles. Oral presentation at the Lunar and Planetary Science Conference, The Woodlands, TX, March 2015. Abstract 1581.

Hofgartner, J.D., Hayes, A.G., Lunine, J.I., Zebker, H., Stiles, B.W., Sotin, C., Barnes, J.W., Turtle, E.P., Baines, K.H., Brown, B.H., Buratti, B.J., Clark, R.N., Encrenaz, P., Kirk, R.D., Le Gall, A., Lopes, R.M., Lorenz, R.D., **Malaska, M.J.**, Mitchell, K., Nicholson, P.D., Paillou, P., Radebaugh, J., Wall, S.D., Wood, C., 2015. Oral presentation at the Lunar and Planetary Science Conference, The Woodlands, TX, March 2015. Abstract 1538.

Lopes, R., **Malaska, M.**, Schoenfeld, A., Birch, S., Hayes, A., 2014. Geomorphic Units on Titan. Poster presented at the American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P23D-4019.

Hodyss, R., Vu, T., Cable, M., Maynard-Casely, H., **Malaska, M.**, Beauchamp, P., 2014. Benzene-Ethane Co-Crystals on the Surface of Titan. Poster presented at the American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P23D-4016.

Schoenfeld, A., **Malaska, M.**, Lopes, R., Le Gall, A., Birch, S., Hayes, A., 2014. A Detailed Geomorphological Sketch Map of Titan's Afekan Crater Region. Poster presented at the American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P23D-4013.

Le Gall, A., Janssen, M., Mastrogiuseppe, M., Hayes, A., Lorenz, R., Encrenaz, P., **Malaska, M.**, 2014. Composition and bathymetry of Ligea Mare, Titan, derived from its 2.2-cm wavelength thermal microwave emission. Poster presented at the American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P23D-4011.

Hofgartner, J., Hayes, A., Lunine, J., Zebker, H., Stiles, B., Sotin, C., Barnes, J., Turtle, E., Baines, K., Brown, R., Buratti, B., Clark, R., Encrenaz, P., Kirk, R., Le Gall, A., Lopes, R., Lorenz, R., **Malaska, M.**, Mitchell, K., Nicholson, P., Paillou, P., Radebaugh, J., Wall, S., Wood, C., 2014. Titan's Magic Island: Transient features in a Titan sea. Talk presented at the American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P22A-06.

Janssen, M., Le Gall, A., Hayes, A.G., Lopes, R., **Malaska, M.**, 2014. Titan's Surface at 2.2-Cm Wavelength: Results and Interpretations through the First Ten Years of Observation by Cassini. Talk presented at the American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P22A-05.

Solomonidou, A., Coustenis, A., Lopes, R., Rodriguez, S., Hirtzig, M., Stephan, K., Sotin, C., Drossart, P., Le Mouelic, S., Lawrence, K., **Malaska, M.**, Jaumann, R., Brown, R., 2014. Unveiling Titan's Mid-Latitude Surface

Michael J. Malaska, Ph.D.

Regions. Talk presented at American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P22A-01.

Birch, S., Hayes, A., Dietrich, W., **Malaska, M.**, Kirk, R., Lucas, A., 2014. Geomorphology of Titan's Polar Regions. Poster presented at the American Geophysical Union meeting, San Francisco, CA, December 2014. Abstract P13A-3803.

Malaska, M., Shoenfeld, A.M., Lopes, R.M., Hayes, A.G., Le Gall, A., Birch, S., Solomindou, A., Neish, C.D., Soderblom, J.M., Farr, T.G., 2014. Geomorphology of Afekan Crater, Titan: Terrain Relationships in Titan's Blandlands. Poster presentation at the American Astronomical Society, Division of Planetary Sciences Annual Meeting 46, Tuscon, AZ, November 2014. Abstract 211.15

Lopes, R.M., **Malaska, M.J.**, Schoenfeld, A.M., Le Gall, A., Hayes, A.G., Birch, S.P., Solominidou, A., 2014. Mapping Titan's Undifferentiated Plains ("Blandlands") to infer their origin. Poster presentation at the American Astronomical Society, Division of Planetary Sciences Annual Meeting 46, Tuscon, AZ, November 2014. Abstract 211.14.

Hayes, A., Mastrogiuseppe, M., Lorenz, R., Hofgartner, J., Lunine, J., Zebker, H. Donelan, M., Wall, S., Stofan, E., Karatekin, O., Natarnicola, C., **Malaska, M.J.**, Le Gall, A., Mitchell, K., Paillou, P., Encrenaz, P., Lopes, R., 2014 The Depth, Composition, and Sea State of Titan's Mare. Oral presentation at the American Astronomical Society, Division of Planetary Sciences Annual Meeting 46, Tuscon, AZ, November 2014. Abstract 112.09.

Malaska, M.J., Radebaugh, J., Lopes, R., Hayes, A., Le Gall, A., Mitchell, K., Solomidou, A., Soderblom, J., Turtle, E., Lorenz, R., Cassini RADAR Team, 2014. Labyrinth Terrain on Titan. Oral presentation at the Geological Society of America Annual Meeting. Vancouver, Canada, October 2014.

Lopes, R., **Malaska, M.J.**, 2014. The Global Geology of Titan from Cassini RADAR data. 40th COSPAR Scientific Assembly, Moscow, Russia. August, 2014.

Solomonidou, A., Coustenis, A., Lopes, R.M.C., **Malaska, M.J.**, Hirtzig, M., Sotin, C., Drossart, P., 2014. Mid-Latitude Regions on Titan as Promising Landing Sites for Future In Situ Missions. 11th International Planetary Probe Workshop, Pasadena, CA. June, 2014.

Malaska, M.J., Mitchell, K., Choukroun, M., Hodyss, R., Cable, M., Hayes, A., Vu, T., Sotin, C., Lorenz, R., 2014. Where is Titan's Ethane? Oral presentation at the 3rd Titan Through Time workshop. John Hopkins University – Applied Physics Laboratory, Laurel, Maryland. April 2014.

Malaska, M.J., Mitchell, K., Hayes, A., Kirk, R., Ford, D., 2014. Possible mechanisms for creating raised ramparts around Titan's lakes. Oral presentation at the 3rd Titan Through Time workshop. John Hopkins University – Applied Physics Laboratory, Laurel, Maryland. April 2014.

Malaska, M., Hodyss, R., 2014. Determination of the solubilities of aromatic molecules in cryogenic ethane at 94 K – application to Titan lake fluids. Oral presentation at the 45th Lunar and Planetary Science Conference. The Woodlands, TX, March 2014. Abstract 1170.

Hofgartner, J.D., Hayes, A.G., Lunine, J.I., Zebker, H., Stiles, B., Sotin, C., Barnes, J.W., Brown, B.H., Encrenaz, P., Kirk, R.D., Le Gall, A., Lopes, R.M., Lorenz, R.D., **Malaska, M.**, Mitchell, K.L., Paillou, P., Radebaugh, J., Turtle, E., Wall, S., Wood, C., and the Cassini RADAR Team, 2014. The case of Titan's mysterious new island: analysis of anomalously bright features observed in the Cassini T92 SAR pass over Titan's Ligea Mare. Oral presentation at the 45th Lunar and Planetary Science Conference. The Woodlands, TX, March 2014. Abstract 1841.

Mitchell, K.L., **Malaska, M.J.**, Horvath, D.G., Andrews-Hannah, J.C., 2014. Karstic processes on Earth and Titan. Poster presentation at the 45th Lunar and Planetary Science Conference. The Woodlands, TX, March 2014. Abstract 2371.

Malaska, M.J., Hodyss, R., Cable, M.L., Choukroun, M., Vu, T., Barnes, J.W., MacKenzie, S., 2013. Transport and concentration of organic molecules on Titan-like worlds. Oral presentation at the Workshop on the Habitability of Icy Worlds, Pasadena, CA, February 2014. Abstract 4020.

Michael J. Malaska, Ph.D.

Cable, M.L., Vu, T., Markus, C., **Malaska, M.**, Choukroun, M., Beauchamp, P., Hodyss, R., 2013. Hydrocarbon trapping in Titan surface materials. Oral presentation at the Workshop on the Habitability of Icy Worlds, Pasadena, CA, February 2014. Abstract 4024.

Hodyss, R., **Malaska, M.J.**, Beauchamp, P., 2014. Techniques for the in situ analysis of Titan lake fluids. Poster presentation at the Workshop on the Habitability of Icy Worlds, Pasadena, CA, February 2014. Abstract 4010.

Lopes, R.M., **Malaska, M.J.**, LeGall, A., Hayes, A., Birch, S.P., Mitchell, K.L., Kirck, R.L., Radebaugh, J., Neish, C., Lucas, A., Lorenz, R.D., Janssen, M.A., Stofan, E.R., Wall, S., Lunine, J.I., Ewing, R.C., Barnes, J.W., 2013. Titan's blandlands: Are they massive sand sheets? Presented at the American Geophysical Union meeting, San Francisco, CA, December 2013. Abstract P53D-1896.

Hayes, A.G., Sotin, C., Hofgartner, J.D., Stiles, B.W., Barnes, J.W., Brown, R.H., Encrenaz, P., Kirk, R.L., LeGall, A., Lopes, R.M., Lorenz, R.D., Lunine, J.I., **Malaska, M.J.**, Mitchell, K.L., Paillou, P., Radebaugh, J., Turtle, E.P., Wall, S., Wood, C.A., Zebker, H.A., 2013. The case for Titan's mysterious new island: An analysis of an anomalously bright feature observed in the T92 SAR pass over Ligeia Mare. To be presented at the American Geophysical Union meeting, San Francisco, CA, December 2013. Abstract P53D-1898.

Hayes, A.G., Dietrich, W.E., Howard, A.D., Kirk, R.L., Lunine, J.I., Mastrogiuseppe, M., **Malaska, M.J.**, Mitchell, K.L., Aharonson, O., Notarnicola, C., Casarano, D., 2013. Constraints on the Evolution of Titan's Lake Basins as Revealed by Stereo Photogrammetry and Bathymetry. Presented at the American Geophysical Union meeting, San Francisco, CA, December 2013. Abstract P52B-05.

Day, M.D., **Malaska, M.J.**, Hosseini, S., McGranaghan, R., Fernandes, P.A., Fougere, N., Clegg, R.N., Scully, J., Alibay, F., Ries, P., Craig, P.L., Hutchins, M.L., Leonard, J., Uckert, K., Patthoff, A., Girazian, Z., 2013. Neptune and Triton: A Study in Future Exploration. Presented at the American Geophysical Union meeting, San Francisco, CA, December 2013. Abstract P51G-1822.

Malaska, M.J., Mitchell, K.L., Wray, R., Boston, P.J., 2013. Planetary Karst. Oral presentation at the Geological Society of America annual meeting, Denver, CO, October 2013. Abstract 72-11.

Malaska, M.J., Hodyss, R.P., Mitchell, K.L., Wray, R., 2013. Laboratory simulation of karst on Titan. Presented at the Geological Society of America annual meeting, Denver, CO, October 2013, Abstract 136-4.

Mitchell, K.L., **Malaska, M.**, Boston, P.J., Wilson, J.L., Wray, R., 2013. Dissolution Geomorphology at 90 K on Saturn's Moon Titan. Presented at the Geological Society of America annual meeting, Denver, CO, October 2013, Abstract 72-12.

Hosseini, S., Ries, P., Fernandes, P., **Malaska, M.**, Scully, J., Clegg, R., Patthoff, A., Alibay, F., Leonard, J., Uckert, K., Day, M., Hutchins, M., Fougere, N., Craig, P., McGranaghan, R., Girazian, Z., Mitchell, K., Budney, C., 2013. TRIDENT: Taking Remote and In-situ Data to Explore Neptune and Triton. Presented at the American Astronomical Society, Division of Planetary Sciences meeting, Denver, CO, October 2013. Abstract 211.29.

Lopes, R.M., **Malaska, M.J.**, LeGall, A., Hayes, A., Mitchell, K.L., Kirk, R., Radebaugh, J., Neish, C., Stofan, E., Janssen, M., Wall, S.D., Lucas, A., Lorenz, R.D., 2013. Titan's "blandlands": nature, distribution, and possible origin of Titan's plains. Presented at the American Astronomical Society, Division of Planetary Sciences meeting, Denver, CO, October 2013. Abstract 302.06.

Lopes, R.M.C., Stofan, E.R., Kirk, R.L., Mitchell, K.L., LeGall, A., Barnes, J.W., Hayes, A., Kargell, J., Radebaugh, J., Janssen, M.A., Niesh, C.D., Wood, C., Wall, S.D., Lunine, J.I., **Malaska, M.J.**, and the Cassini Radar Team, 2013. Cryovolcanic Features on Titan. Presented at the European Planetary Science Congress 2013, London, UK, September 2013. Abstract EPSC2013-253.

Hayes, A., Dietrich, W.E., Kirk, R.L., Michaelides, K.L., Mitchell, K.L., **Malaska, M.**, Turtle, E.P., Barnes, J.W., Lucas, A., Aharonson, O., 2013. Constraining the Evolution of Titan's North Polar Landscape. Presented at the European Planetary Science Congress 2013, London, UK, September 2013. Abstract EPSC2013-247.

Cornet, T., Bourgeois, O., Le Mouelic, S., Sotin, C., Fleurant, C., Lefevre, A., Rodriguez, S., **Malaska, M.**, Barnes, J.W., Brown, R.H., Baines, K.H., Buratti, B., Clark, R.N., Nicholson, P.D., 2013. Surface dissolution on Titan:

Michael J. Malaska, Ph.D.

Ontario Lacus, Sikun Labyrinthus and other karst-like landscapes. Presented in August 2013 at the 8th IAG International Conference on Geomorphology, Paris, France.

Malaska, M., and Hodyss, R., 2013. Laboratory investigation of benzene dissolving in a Titan ethane lake. Oral presentation at the 44th Lunar and Planetary Science Conference. The Woodlands, TX, March 2013. Abstract 2744.

Wood, C.A., Stofan, E.R., Hayes, A.G., Kirk, R.L., Lunine, J.I., Radebaugh, J., **Malaska, M.**, 2013. Morphological evidence for former seas near Titan's south pole. Presented at the 44th Lunar and Planetary Science Conference. The Woodlands, TX, March 2013. Abstract 1764.

Lopes, R., LeGall, A., Kirk, R., Kargel, J., Stofan, E., Mitchell, K., Lucas, A., Janssen, M., Wall, S., **Malaska, M.**, and the Cassini RADAR Team, 2012. Titan's mid-latitude plains: global distribution and possible origin. Presented at the American Geophysical Union fall meeting. San Francisco, CA, November 2012.

Stofan, E.R., Aharonson, O., Hayes, A., Kirk, R., Lopes, R., Lorenz, R.D., Lucas, A., Lunine, J.I., Radebaugh, J., Turtle, E., Wall, S., Wood, C., **Malaska, M.**, and the Cassini Radar Team, 2012. Searching for the remnants of the southern seas: Cassini observations of the south pole of Titan. Presented at the Division of Planetary Sciences meeting. Reno, NV, October 2012.

Radebaugh, J., Lorenz, R.D., Lunine, J.I., Kirk, R.D., Ori, G.G., Farr, T.G., Malaska, M., Le Gall, A., Hayes, A., Lieu, Z.Y.C., Lopes, R.M.C., Turtle, E., Wall, S., Stofan, E.R., Wood, C., Cassini RADAR Team, 2012. Coexistence of dunes and humid conditions at Titan's tropics. Presented at the American Astronomical Society, Division of Planetary Sciences meeting, Reno, NV, October 2012.

Lopes, R.M.C., Stofan, E.R., Wall, S., D., Wood, C., Kirk, R.L., Lucas, A., Mitchell, K.L., Lunine, J.I., Turtle, E.P., Radebaugh, J., **Malaska, M.**, Cassini RADAR Team, 2012. Titan's "Hot Cross Bun": A Titan Laccolith? Presented at the American Astronomical Society, Division of Planetary Sciences meeting, Reno, NV, October 2012.

Barnes, J.W., Buratti, B.J., Turtle, E.P., Bow, J., Dalba, P.A., Perry, J., Brown, R.H., Rodriguez, S., LeMouélic, S., Baines, K.H., Sotin, C., Lorenz, R.D., **Malaska, M.J.**, McCord, T.B., Clark, R.N., Jaumann, R., Hayne, P., Nicholson, P.D., Soderblom, J.M., Soderblom, L.A., 2012. VIMS Near-Infrared Imaging and Spectra of Precipitation-Associated Surface Changes. Presented at the 2nd Titan Through Time Conference, NASA Goddard Space Flight Center, Greenbelt, MD, April 2012.

Malaska, M., Radebaugh, J., Barnes, J., Mitchell, K., 2012. Titan in a Fume Hood: Room-Temperature Simulation of a Titan Evaporite Playa Using a Multi-Component Mixture of Organic Compounds. Presented at the 43rd Lunar and Planetary Science Conference, The Woodlands, TX, March 2012. Abstract 2139.

Barnes, J.W., Buratti, B.J., Turtle, E.P., Bow, J., Dalba, P.A., Perry, J., Rodriguez, S., LeMouélic, S., Baines, K.H., Sotin, C., Lorenz, R.D., **Malaska, M.J.**, McCord, T.B., Brown, R.H., Clark, R.N., Jaumann, R., Hayne, P., Nicholson, P.D., Soderblom, J.M., Soderblom, L.A., 2012. Cassini/VIMS Spectra and Time-Evolution of Precipitation-Associated Surface Brightenings on Titan. Presented at the 43rd Lunar and Planetary Science Conference, The Woodlands, TX, March 2012. Abstract 2762.

Malaska, M., Radebaugh, J., Mitchell, K., Lopes, R., Wall, S., Lorenz, R., 2011. Surface dissolution model for Titan karst. Oral presentation at the First International Planetary Cave Research Workshop, Carlsbad, NM, October 2011. Abstract 8018.

Mitchell, K.L., **Malaska, M.**, 2011. Karst on Titan. Oral presentation at the First International Planetary Cave Research Workshop, Carlsbad, NM, October 2011. Abstract 8021.

Malaska, M., 2011. Chemical Origins of Titan Dunes. Oral presentation at Titan Dunes Workshop, Pasadena, CA, July 2011.

Malaska, M., Radebaugh, J., Le Gall, A., Mitchell, K., Lopes, R., Wall, S., 2011. High-Volume Meandering Channels in Titan's South Polar Region. Poster presentation at the 42nd Lunar and Planetary Science Conference, The Woodlands, TX, March 2011. Abstract 1562.

Michael J. Malaska, Ph.D.

Malaska, M., Radebaugh, J., Le Gall, A., Mitchell, K., Lopes, R., Wall, S., 2011. Evidence for an Eroded Upwarp near Sikun Labyrinthus, Titan. Poster presentation at the 42nd Lunar and Planetary Science Conference, The Woodlands, TX, March 2011. Abstract 1567.

Malaska, M., 2010. Titan Lake Properties. Oral presentation at the Titan Lakes Workshop held during the Cassini Planetary Science Group Meeting #52 at NASA-JPL, Pasadena, CA, October 2010.

Malaska, M., Radebaugh, J., Lorenz, R., Mitchell, K., Farr, T., Stofan, E., 2010. Identification of Karst-like Terrain on Titan from Valley Analysis. Poster presented at the 41st Lunar and Planetary Science Conference, The Woodlands, TX, March 2010. Abstract 1544.

Radebaugh, J., Baker, V., Lorenz, R.D., Farr, T.G., Lopes, R.M.C., Kirk, R.L., Stofan, E.R., Wall, S.D., Wood, C.D., Mitchell, K.L., Lunine, J.I., **Malaska, M.**, Valora, P., CASSINI RADAR Team, 2009. Fluvial Erosion on Titan: Scales and Landform Modification. Presented at the 41st American Astronomical Society, Division of Planetary Sciences meeting of the American Astronomical Society, Puerto Rico, PR, November 2009. Abstract #36.07.

Nelson, K., Février, F., Higuchi, K., Smitley, C., Lopes, A., Absher, P., Fayson, J., Narasimhan, S., Sim, S., Comins, D., Huber, S., Houck, D., Bost, F., **Malaska, M.**, 2003. Integrating High-Throughput Synthesis and Purification to Efficiently Deliver High Quality Compounds for Discovery: A MEDCHEM Factory(TM). Poster presentation at Diversity-Oriented Synthesis and Natural Product Chemistry, Boston, MA, October 2003.

Knopp, M., **Malaska, M.J.**, David, E., Perez-Marias, D., **Siesel, B.A.**, Vollhardt, K.P.C., 1997. Application of the cobalt-mediated [2+2+2]-cycloaddition to the synthesis of opioid analgesics morphine, codeine, and thebaine. Oral presentation at the 213th American Chemical Society National Meeting, San Francisco, CA, April 1997.

Andaloro, V.J., Crews, F.T., Fauq, A., Ognyanov, V.I., **Malaska, M.J.**, Kozikowski, A.P., 1994. Effects of *myo*-Inositol Analogs on Muscarinic Stimulated Calcium Signalling. Poster presented at the 24th annual meeting of the Society of Neuroscience, Miami, FL, November 1994.

Andaloro, V.J., Crews, F.T., Fauq, A., Ognyanov, V.I., **Malaska, M.J.**, Kozikowski, A.P., 1993. Effects of *myo*-Inositol Analogs on Muscarinic Stimulated Calcium Signalling. Presented at Medicinal Chemistry Approaches to Alzheimer's Disease and Other Dementias, Ponte Vedra Beach, FL, September 1993.

Malaska, M.J., Fauq, A.H., Kozikowski, A.P., Aagaard, P.J., McKinney, M., 1993. Simplified Himbacine Analogs: High Affinity Ligands for the M1 and M2 Muscarinic Receptors. Oral presentation at the 206th American Chemical Society National Meeting, Chicago, IL, August 1993.

Malaska, M.J., Vollhardt, K.P.C., 1990. The Rearrangement of Cyclohexadiene Cobalt Complexes Derived from the Cobalt-Mediated [2+2+2]Cycloaddition of *w*-Alkynyl Thiophenes with Alkynes. Presented at the 199th American Chemical Society National Meeting, Boston, MA, April 1990.

TEACHING EXPERIENCE

University of California, Berkeley/Lawrence Berkeley Laboratory **August 1986 – December 1991**
Teaching assistant in Introductory Organic Chemistry for both lecture and laboratory sessions (four semesters).

MENTORSHIP AND MANAGERIAL EXPERIENCE

PhD scientists

Manager responsible for advancement and training of scientists and project leaders at SCYNEXIS, Inc. with up to 10 direct reports spanning two project groups.

Postdoctoral mentorship

Sarah Dimick-Gray – mentored as a postdoc 1999-2000, currently Assistant professor at Metropolitan State University, Minneapolis, MN.

Michael J. Malaska, Ph.D.

Francesco Cassucelli – mentored as a postdoc 1997-1999, currently Senior Scientist at Nerviano Medical Sciences, Milan Italy.

Andrew Jones – mentored as a postdoc 1996-1998, currently Senior Scientist at Selcia, Ltd. Ongar, United Kingdom.

Undergraduate students

Tiffany Verlander – mentored as an undergraduate student intern 2016-2017, to become a graduate student in environmental science at Oklahoma University, Tulsa, OK.

Ashley Shoenfeld – co-mentored (with Rosaly Lopes at JPL) as an undergraduate student intern 2014, current graduate student in planetary science at UCLA.

Roger Michealides – co-mentored (with Tom Farr at JPL) as an undergraduate student intern 2014, currently a graduate student at Stanford.

Marine Minveille – mentored as an undergraduate student intern 2010-2011, currently Formulation Scientist, bioMerieux, Research Triangle Park, NC.

Florence Fevrier-Wagner – mentored as an undergraduate student intern 2001-2002, currently Director, Medicinal Chemistry, Broad Institute, Cambridge, MA.

Jean-Claude Adelbrecht – mentored as an undergraduate student intern 1997-1998, currently Director of Business Development, ChemSpeed, Basel, Switzerland.

PUBLIC TALKS AND OUTREACH

“Astrobiology and search for alien life” presented at California State Univeristy, Northridge, CA. November, 2017.

“Titan: An Earth-like world in the Outer Solar System” presented to Los Angeles Astronomical Society, Los Angeles, CA, August 2017.

“Titan: An Earth-like world in the Outer Solar System” presented to The Planetary Society, Pasadena, CA, July 2017.

“Titan revealed” presented at the 20 anniversary celebration of the NASA JPL Solar System Ambassador Program, Pasadena, CA, June 2017.

“Dissolving Titan: Dissolution geology on Saturn’s moon” telepresentation to 8th grade class in San Diego, CA. May 2017.

“Astrobiology and the search for alien life” presented at the College of the Canyons Star Party, Santa Clarita, CA, May 2017.

“Titan, the Mojave, and Death Valley” presented at the Death Valley MarsFest 2017, Death Valley National Park, CA, March 2017.

“Exploring Titan’s Earth-like landscape” presented to the Santa Barbara Astronomical Unit, Santa Barbara, CA., February 2017.

“Exploring Titan’s Earth-like landscape” presented to the Coast Geological Society, Ventura, CA., April, 2015.

“Astrobiology and Life on Earth” presented at Tillicum Middle School, Bellevue, WA, February, 2015.

"Astrobiology 101: The Search for Alien Life" presented at the Alhambra Public Library, Alhambra, CA, June 2013.

Michael J. Malaska, Ph.D.

- "Astrobiology 101: The Search for Alien Life" simulcast presentation from New Mexico Tech, Socorro, NM (live) to Asheville Astronomy Club, Asheville, NC (via distance learning video link). March, 2014.
- "AVIATR airplane mission concept to Titan" presented to the San Gabriel Valley Radio Control Club, August, 2013.
- "Astrobiology 101: The Search for Alien Life" presented at San Gabriel Mission High School, San Gabriel, CA, July, 2013.
- "Titan: An Earth-like world in the Outer Solar System" presented at the Alhambra Public Library, Alhambra, CA, June 2013.
- "Mystery Moon Titan" presented to the Crescenta Valley Radio Club, Glendale, CA, April 2013.
- "Mystery Moon Titan" presented to the South Bay Astronomy Club, Torrance, CA, April 2013.
- "Mystery Moon Titan" presented to the Antelope Valley Astronomy Club, Palmdale, CA, March 2013.
- "Astrobiology 101: The Search for Alien Life" presented to the Whittier Rotary Club, Whittier, CA, February 2013.
- "Fun for all ages: creating and mapping a volcano" article for the Planetary Society Blog, posted August 18, 2012 (permalink: <http://www.planetary.org/blogs/guest-blogs/20120818-fun-for-all-ages-volcano.html>)
- "Gale Crater reveals the geology of Mars" presented at the North Carolina Museum of Natural Sciences, MSL landing event, Raleigh, NC, August 2012.
- "Mars Science Laboratory Curiosity rover" presented at Morehead Planetarium during the MSL landing pre-event, Chapel Hill, NC, August 2012.
- "MSL Curiosity landing site at Gale Crater, Mars" presented at Morehead Planetarium during the MSL landing pre-event, Chapel Hill, NC, August 2012.
- "AVIATR airplane mission to Titan" presented to Morehead Planetarium "Moon, Mars, and Beyond" summer camp, July 2012.
- "Astrobiology and the search for alien life" presented to the Raleigh Astronomy Club, Raleigh, NC, July 2012.
- "Astrobiology and the search for alien life" presented to a Girl Scouts Camp, Staunton River State Park, VA, July 2012.
- "Exoplanet worlds around other stars" presented to a Girl Scouts Camp, Staunton River State Park, VA, July 2012.
- "Earth's evil twin: planet Venus" presented at Morehead Planetarium during the Venus transit, Chapel Hill, NC, June 2012.
- "Hunting for exoplanets" presented at Morehead Planetarium during the Venus transit, Chapel Hill, NC, June 2012.
- "AVIATR airplane mission to Titan" presented at Pisgah Astronomical Research Institute, Rosman, NC, May 2012.
- "Earth's toughest life could survive on Mars", article for the Planetary Society Blog, posted May 15, 2012 (permalink: <http://www.planetary.org/blogs/guest-blogs/20120515-earth-life-survive-mars.html>).
- "Mars Science Laboratory Curiosity at Gale Crater" presented at Astronomy Days at the North Carolina Museum of Natural Sciences, Raleigh, NC, May 2012.
- "Astrobiology and the search for alien life" presented at Astronomy Days at the North Carolina Museum of Natural Sciences, Raleigh, NC, May 2012.
- "Exoplanet worlds around other stars" presented at Astronomy Days at the North Carolina Museum of Natural Sciences, Raleigh, NC, May 2012.

Michael J. Malaska, Ph.D.

“Volcano on the far side of the Moon” presented at Astronomy Days at the North Carolina Museum of Natural Sciences, Raleigh, NC, May 2012.

“Hyperspectral imaging: beyond visible light” presented to students at Greensboro Day School, Greensboro, NC, May 2012.

“Exoplanets: Planets around other stars” presented to Root Elementary students, Raleigh, NC, April 2012.

“AVIATR airplane mission to Titan” presented at the Carolina Space Symposium, University of North Carolina - Chapel Hill, Chapel Hill, NC, March 2012.

“AVIATR airplane mission to Titan” presented at the Staunton River Star Party, Staunton River State Park, VA, March 2012.

“Extreme Storm on Saturn!!!” presented as an introduction to the Omnidome film “Wildest Weather in the Solar System” Moorehead Planetarium, Chapel Hill, NC, March 2012.

“Mystery Moon Titan” presented to Wakefield High School students, Raleigh, NC, February 2012.

“Making Planets” presented to Philips Middle School students, Chapel Hill, NC, February 2012.

“Mystery Moon Titan” presented to Discovery Corps student volunteers at the Pacific Science Center, Seattle, WA, January 2012.

Radio interview on Planetary Radio on the production of the the IMAX movie “Outside In”, airdate January 16, 2012 (permalink: <http://www.planetary.org/radio/show/00000480/>).

“Extreme Storm on Saturn!!!” presented as an introduction to the Omnidome film “Wildest Weather in the Solar System” at the planetarium of the Natural Science Center, Greensboro, NC, December 2011.

“Titan’s Earthlike Landscape” presented to the Chapel Hill Astronomy Club, Chapel Hill, NC, December 2011.

“Titan’s Earthlike Landscape” presented to the Asheville Astronomy Club, Asheville, NC, November 2011.

“Dawn Mission to Asteroid 4 Vesta” presented at the First Staunton River Star Party, Staunton River State Park, South Boston, VA, September 2011.

“Postcards of Earth” presented to a group of Boy Scouts during public viewing event at the Staunton River Star Party, Staunton River State Park, South Boston, VA, September 2011.

“Vesta Fiesta” presented at the Fiesta Grill restaurant, Chapel Hill, NC, August 2011.

“Dawn Mission to Asteroid 4 Vesta” presentation and partial event organization at the North Carolina Museum of Natural Sciences, Raleigh, NC, August 2011.

“Dawn Mission to Asteroid 4 Vesta” presented at the Orange County Public Library, Hillsborough, NC, August 2011.

“Impact! Craters in our Solar System” class exercise on cratering for the Fuquay-Varina Day Camp (K-4th grade), Fuquay-Varina, NC, June 2011.

“Titan’s Earthlike Landscape” presented to the Raleigh Astronomy Club, Raleigh, NC, June 2011.

Developed Citizen Science exhibit for the Astronomy Days event at the North Carolina Museum of Natural Science, Raleigh, NC, May 2011.

“Citizen Science projects for Planetary Science: Get Involved! Do Science!”, article for the Planetary Society Blog, posted May 12, 2011 (permalink: <http://planetary.org/blog/article/00003030/>).

“LPSC 2011: Lunar Layers” article for the Planetary Society Blog, posted March 29, 2011. (permalink: <http://planetary.org/blog/article/00002980/>).

Michael J. Malaska, Ph.D.

“LPSC 2011: Sponge-moon Hyperion”, article for the Planetary Society Blog, posted March 23, 2011 (permalink: <http://planetary.org/blog/article/00002971/>).

“The Geologic Story of NE Utah: plates, layers, erosion, and fossils” organized presentation, exhibit, and fossil-screening for undergraduate Earth Science class at Methodist University, Fayetteville, NC, March 2011.

“Making a Model Comet” comet-making demonstration presented at the Green Hope Elementary School, Cary, NC, February 2011.

“The Stardust-NExT Spacecraft Flyby of Comet Temple 1” presentation and comet-making demonstration at the North Carolina Museum of Natural Sciences, Raleigh, NC, February 2011.

“Making Planets” presented at the University of North Carolina Science Expo, University of North Carolina – Chapel Hill, Chapel Hill, NC, September 2010.

“Making Planets” presented at the North Carolina Museum of Natural Sciences Raleigh, NC, January 2010.

“Footsteps and Footpads: Surface views of the Solar System” presented at the Science Fair at St. Thomas Moore School, Chapel Hill, NC, May 2010.

“Direct from Saturn Orbit: Cassini Images” presented to the Chapel Hill Astronomy Club, Chapel Hill, NC, June 2010.

NASA-JPL press release on March 4, 2010 “Is that Saturn’s Moon Titan or Utah?”.
<http://www.jpl.nasa.gov/news/news.cfm?release=2010-078>.

“Places in the Solar System” presented to the 6th grade classes at Washington Middle School, Seattle, WA, December 2009.

“The Great Observatories Unveil the Galactic Center” presented at the unveiling of the Galactic Center display at the North Carolina Museum of Natural Sciences, October 2009.

“Titan in 3D”, article for the Planetary Society Blog, posted July 24, 2009 (permalink: <http://www.planetary.org/blog/article/00002025/>).

OTHER ACTIVITIES

JPL Planetary Science Summer School 2013. Served as principle investigator (PI) for a student spacecraft mission proposal to flyby the Neptune/Triton system.

Volunteer in the JPL Speakers Bureau for education and outreach. (January 2013 to present.)

Volunteer in the NASA/JPL in Solar System Ambassador Program for public outreach. (http://www2.jpl.nasa.gov/ambassador/profiles/Michael_Malaska.htm) (January 2011 to October 2012).

Volunteer as a Resource Speaker for Chapel Hill-Carrboro Public Schools. (December 2011 to October 2012).

Volunteer field geology research with state geologists mapping the rock exposures of Chatham county, North Carolina. (March 2012-October 2012).

Associate of the Cassini RADAR Team (2012-present)

Volunteer artist for the AVIATR Titan airplane mission concept.

Titan geology consultant (credited) for National Geographic planetarium film “Wildest Weather in the Solar System.” (movie released November 2011). (January 2010-November 2011).

Michael J. Malaska, Ph.D.

Co-Executive producer and graphical artist for “In Saturn's Rings”, an IMAX movie about space exploration. (<http://www.insaturnsrings.com/>) (imdb credit as “Associate Producer”). (December 2009 to present).

PROFESSIONAL SKILLS

Microsoft Office (Word, Excel, Powerpoint)
WebLabViewer Pro
Photoshop
ArcGIS
QGIS
IGORPro

LANGUAGES

English (native),
French (fluent: written, spoken)

PROFESSIONAL MEMBERSHIPS

Member of the American Chemical Society
Member of the American Geophysical Union
Member of the Geological Society of America
Member of the Division of Planetary Sciences of the American Astronomical Society
Fellow of the The Explorers Club