

Curriculum Vitae: Michael W. Busch

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Academic & Employment History

BS Physics & Astrophysics, University of Minnesota, awarded May 2005.

PhD Planetary Science, Caltech, defended April 5, 2010.

JPL Planetary Science Summer School, July 2006.

Hertz Foundation Graduate Fellow, September 2007 to June 2010.

Postdoctoral Researcher, University of California Los Angeles, August 2010 – August 2011.

Jansky Fellow, National Radio Astronomy Observatory, August 2011 – August 2014.

Visiting Scholar, University of Colorado Boulder, July – August 2012.

Research Scientist, SETI Institute, August 2013 – present.

Current Funding Sources: NASA Near Earth Object Observations.

Research Interests:

- Shapes, spin states, trajectories, internal structures, and histories of asteroids.
- Identifying and characterizing targets for both robotic and human spacecraft missions.
- Ruling out potential future asteroid-Earth impacts.
- Radio and radar astronomy techniques.

Selected Recent Papers:

Marshall, S.E., and 24 colleagues, including Busch, M.W., 2019. *Shape modeling of potentially hazardous asteroid (85989) 1999 JD6 from radar and lightcurve data*, Icarus **submitted**.

Reddy, V., and 69 colleagues, including Busch, M.W., 2019. *Near-Earth asteroid 2012 TC4 campaign: results from global planetary defense exercise*, Icarus 326, 133-150.

Brozović, M., and 16 colleagues, including Busch, M.W., 2018. *Goldstone and Arecibo radar observations of (99942) Apophis in 2012-2013*, Icarus 300, 115-128.

Brozović, M., and 19 colleagues, including Busch, M.W., 2017. *Goldstone radar evidence for short-axis mode non-principal axis rotation of near-Earth asteroid (214869) 2007 PA8*. Icarus 286, 314-329.

Naidu, S.P., Benner, L.A.M., Margot, J.L., Busch, M.W., Taylor, P.A., 2016. *Capabilities of Earth-based radar facilities for near-Earth asteroid observations*, Astronomical Journal, 152 99.

Recent Conference Presentations

- Busch, M.W., Rožek, A., Marshall, S.E., Young, G., Cobb, A., Raïssi, C., Gal, Y., Benner, L.A.M., Naidu, S.P., Brozović, M., Taylor, P.A., 2018. *Automating asteroid shape modeling from radar images*, 42nd COSPAR Assembly, Pasadena, California USA
- Busch, M.W., Benner, L.A.M., Nolan, M.C., Ostro, S.J., Margot, J.L., Magri, C., Giorgini, J.D., Pravec, P., 2017. *Arecibo radar characterization of 138971 (2001 CB21), a flyby target for the DART spacecraft*, 5th IAA Planetary Defense Conference, Tokyo, Japan.
- Busch, M.W., 2016. *Internal structures of near-Earth asteroids from ground- and space-based observations*, CAS-NAS Forum for New Leaders in Space Science, Irvine, CA, USA.

Education And Public Outreach

Research mentor for the SETI Institute REU Program (2015, 2016) and the NASA Frontier Development Lab (2016, 2017).

Public engagement via social media and science-themed events organized by the SETI Institute.

Previously Funded Research:

- PI: “Radar Speckle Investigations of Near-Earth Asteroid Spin States”, NASA Solar System Observations Program, Near Earth Object Observations (2016)
- PI: “Radar Speckle Observations of Near-Earth Asteroids”, NASA Solar System Observations Program, Near Earth Object Observations (2013)
- PI: SETI Institute NEOShield Project, European Commission (2011)
- Co-I: “Radar Reconnaissance of Near-Earth Asteroids”, NASA Solar System Observations Program, Near Earth Object Observations (2017). PI Lance A.M. Benner.
- Co-I: “Radar Reconnaissance of Near-Earth Asteroids”, NASA Solar System Observations Program, Near Earth Object Observations (2014). PI Lance A.M. Benner

Full List of Publications

Papers:

- Busch, M.W., Ostro, S.J., Benner, L.A.M., Giorgini, J.D., Jurgens, R.F., Rose, R., Magri, C., Pravec, P., Scheeres D.J, Broschart, S.B., 2006. *Radar and optical observations and physical modeling of near-Earth asteroid 10115 (1992 SK)*, Icarus, 181 145-155.
- Busch, M.W., 2006. *Feasibility of Asteroid Mining*, Society of Economic Geologists Newsletter, April 2006.
- Busch, M.W., Ostro, S.J. Benner, L.A.M., Giorgini, J.D., Magri, C., Howell, E.S., Nolan, M.C., Hine, A.A., Campbell, D.B., Shapiro, I.I., Chandler, J.F., 2007. *Arecibo Radar Observations of Phobos and Deimos*, Icarus, 186 581-584.
- Busch, M.W., Kulkarni, S.R., Conrad, A.R., Cameron, P.B., 2007. *Keck adaptive optics imaging of near-Earth asteroid 2004 XP14*, Icarus, 189 589-590.
- Busch, M.W., Giorgini, J.D., Ostro, S.J., Benner, L.A.M., Jurgens, R.F, Hicks, M.D., Pravec, P., Kusnirak, P., Ireland, M.J., Scheeres, D.J., Broschart, S.B., Magri, C., Nolan, M.C., Hine, A.A., Margot, J.L., 2007. *Physical modeling of near-Earth asteroid (29075) 1950 DA*, Icarus 190 608-621.
- Busch, M.W., Benner, L.A.M., Ostro, S.J., Giorgini, J.D., Jurgens, R.F., Rose, R., Scheeres, D.J., Magri, C., Margot, J.L., Nolan, M.C., Hine, A.A., 2008. *Physical properties of near-Earth asteroid (33342) 1998 WT24*, Icarus 195 614-621.
- Busch, M.W., Aharonson, O., 2008. *Measuring subsurface water distribution using the Dynamic Albedo of Neutrons Instrument on Mars Science Laboratory*, NIMA 592 393-399.
- Busch, M.W., 2008. *ALMA and Asteroid Science*, Icarus 200, 347-349.
- Busch, M.W., Kulkarni, S.R., Conrad, A., 2009. *No satellites around 21 Lutetia*, Icarus 203, 677-680.
- Busch, M.W., Kulkarni, S.R., Briskin, W., Ostro, S.J., Benner, L.A.M., Giorgini, J.D., Nolan, M.C., 2010. *Determining asteroid spin states using radar speckles*, Icarus 209, 535-541.
- Busch, M.W., Ostro, S.J., Benner, L.A.M., Brozović, M., Giorgini, J.D., Jao, J.S., Scheeres, D.J., Magri, C., Nolan, M.C., Howell, E.S., Taylor, P.A., Margot, J.L., Briskin, W., 2011. *Radar observations and the shape of near-Earth asteroid 2008 EV5*, Icarus 212, 649-660.
- Busch, M.W., Reddick, R.M., 2011. *Testing SETI message designs*, in "Communication With Extraterrestrial Intelligence", D.A. Vakoch editor, 419-423.
- Benner, L.A.M., Ostro, S.J., Magri, C., Nolan, M.C., Howell, E.S., Giorgini, J.D., Jurgens, R.F., Margot, J.L., Taylor, P.A., Busch, M.W., 2008. *Near-Earth asteroid surface roughness depends on compositional class*, Icarus 198, 294-304.
- Benner, L.A.M., Busch, M.W., Giorgini, J.D., Taylor, P.A., Margot, J.L., Nolan, M.C., 2015. *Radar observations of near-Earth and main-belt asteroids*, review chapter in Asteroids IV, U. Arizona Press.
- Brophy, J., and 33 colleagues, 2012. *Asteroid retrieval feasibility study*, Keck Institute for Space Studies, California Institute of Technology, Pasadena CA, USA.
- Brozović, M., and 19 colleagues, 2011. *Radar and optical observations and physical modeling of triple near-Earth asteroid (136617) 1994 CC*, Icarus 216, 241-256.
- Brozović, M., Benner, L.A.M., Busch, M.W., Giorgini, J.D., Slade, M.A., Lawrence, K.J., 2016. *Recent Goldstone radar observations of near-Earth asteroids less than 140 m in diameter*, In Asteroids: New Observations, New Models. Proceedings IAU Symposium

- No. 318, 2015. Chesley, S.R., Morbidelli, A., Jedicke, R., Farnocchia, D. editors, pages 160-169. Cambridge University Press, Cambridge.
- Brozović, M., and 19 colleagues, 2017. *Goldstone radar evidence for short-axis mode non-principal axis rotation of near-Earth asteroid (214869) 2007 PA8*. *Icarus* 286, 314-329.
- Brozović, M., and 16 colleagues, 2018. *Goldstone and Arecibo radar observations of (99942) Apophis in 2012-2013*, *Icarus* 300, 115-128.
- Chesley, S.R., and 15 colleagues, 2014. *Orbit and bulk density of the OSIRIS-REx target asteroid (101955) Bennu*, *Icarus*, 235 5-22.
- Giorgini, J.D., Benner, L.A.M., Ostro, S.J., Nolan, M.C., Busch, M.W., 2008. *Predicting the Earth encounters of (99942) Apophis*, *Icarus* 193, 1-19.
- Haqq-Misra, J., Busch, M.W., Som, S., Baum, S., 2013. *The benefits and harms of transmitting into space*, *Space Policy*, 29, 40-48.
- Harris A.W., and NEOSShield Consortium, 2015. *NEOSShield final report: a global approach to near-Earth object impact threat mitigation*, European Commission FP7 Project No. 282703.
- Magri, C., and 25 colleagues, 2010. *Radar and photometric observations and shape modeling of contact binary near-Earth asteroid (8567) 1996 HW1*, *Icarus* 214, 210-227.
- Marshall, S.E., and 24 colleagues, 2019. *Shape modeling of potentially hazardous asteroid (85989) 1999 JD6 from radar and lightcurve data*, *Icarus* **submitted**.
- Naidu, S.P., Margot, J.L., Busch, M.W., Taylor, P.A., Nolan, M.C., Howell, E.S., Brozović, M., Benner, L.A.M., Giorgini, J.D., Magri, C., 2013. *Radar imaging and physical characterization of near-Earth asteroid (162421) 2000 ET70*, *Icarus*, 226 323-335.
- Naidu, S.P., Margot, J.L., Taylor, P.A., Nolan, M.C., Busch, M.W., Benner, L.A.M., Brozović, M., Giorgini, J.D., Jao, J.S., Magri, C., 2015. *Radar imaging and characterization of binary near-Earth asteroid (185851) 2000 DP107*, *AJ*, 150, 2.
- Naidu, S.P., Benner, L.A.M., Margot, J.L., Busch, M.W., Taylor, P.A., 2016. *Capabilities of Earth-based radar facilities for near-Earth asteroid observations*, *Astronomical Journal*, 152 99.
- Ostro, S.J., Magri, C., Benner, L.A.M., Giorgini, J.D., Nolan, M.C., Hine, A.A., Busch, M.W., Margot, J.L., 2009. *Radar imaging of asteroid 7 Iris*, *Icarus* 207, 285-294.
- Reddy, V., and 69 colleagues, 2019. *Near-Earth asteroid 2012 TC4 observing campaign: results from a global planetary defense exercise*, *Icarus* 326, 133-150.
- Shepard, M.K., and 12 colleagues, 2006. *Radar, optical, and thermal observations of binary near-Earth asteroid 2002 CE26*, *Icarus* 184, 198-210.
- Taylor, P.A., and 23 colleagues, 2019. *Planetary radar astronomy with ground-based astrophysical assets*, white paper submitted to the 2020 Astronomy Decadal Survey.
- Takahashi, Y., Busch, M.W., Scheeres, D.J., 2013. *Spin State and Moment of Inertia Characterization of 4179 Toutatis*, *Astronomical Journal* 146, 95.

IAU Circulars:

- Benner, L.A.M., Giorgini, J.D., Ostro, S.J., Jurgens, R.F., Busch, M.W., #8589: 2005 OE3
- Benner, L.A.M., Giorgini, J.D., Ostro, S.J., Nolan, M.C., Busch, M.W., #8711: (99942) Apophis
- Benner, L.A.M., Ostro, S.J., Giorgini, J.D., Busch, M.W., Rose, R., Slade, M.A., Jurgens, R.F., Nolan, M.C., Hine, A.A., Black, G.J., Carter, L.M., #8826: 2006 VV2
- Benner, L.A.M., Ostro, S.J., Giorgini, J.D., van Brimmer, J., Juare, L., Jao, J.S., Jurgens, R.F., Slade, M.A., Busch, M.W., #8866: 2007 DT103

Giorgini, J.D., Benner, L.A.M., Ostro, S.J., Nolan, M.C., Busch, M.W., #8593: (99942) Apophis
Nolan, M. C., and 12 colleagues, #8921: 2001 SN263

CBETs:

Naidu, S.P., and 12 colleagues, 2015, #4191: (410777) 2009 FD.

Conference Presentations:

- Busch, M.W., Lysak, R.L., 2004. *Auroral Ion Acceleration by Alfvén Waves*, SM21A-0450, 2004 Fall AGU Meeting, San Francisco, California, USA.
- Busch, M.W., Ostro, S.J., Benner, L.A.M., Giorgini, J.D., Jurgens, R.F., Magri, C., Pravec, P., Scheeres, D.J., Broschart, S.B., 2005. *Radar observations and physical modeling of near-Earth asteroid 10115 (1992 SK)*, 2005 DPS Meeting, Cambridge, UK.
- Busch, M.W., and 11 colleagues, 2006. *Physical Modeling of Near-Earth Asteroid 29075 (1950 DA)*, 2006 DPS Meeting, Pasadena, California, USA.
- Busch, M.W., Heavens, N.G., Butler, B.J., Kulkarni, S.R., McEwan, I.J., Richardson, M.I., 2007. *Mars' L-band radio emission*, 2007 DPS Meeting, Orlando, Florida, USA.
- Busch, M.W., Ostro, S.J., Kulkarni, S.R., Brisken, W., Nolan, M.C., 2008. *Radar interferometric imaging of near-Earth objects*, 2008 DPS Meeting, Cornell, New York, USA.
- Busch, M.W., Kulkarni, S.R., Ostro, S.J., Brisken, W., Benner, L.A.M., Nolan, M.C., Giorgini, J.D., Brozović, M., Magri, C., 2009. *Delay-doppler and radar-interferometric imaging of the near-Earth asteroid 2008 EV5*, 2009 DPS Meeting, Fajardo, Puerto Rico, USA.
- Busch, M.W., and 12 colleagues, 2010. *Radar observations and the shape of 2008 EV5: ridges and craters on near-Earth asteroids*, 2010 DPS Meeting, Pasadena, California, USA.
- Busch, M.W., Benner, L.A.M., Scheeres, D.J., Magri, C., Takahashi, Y., Margot, J.L., Nolan, M.C., Giorgini, J.D., 2011. *Twenty years of Toutatis*, 2011 EPSC-DPS Joint Meeting, Nantes, France.
- Busch, M.W., and 16 colleagues, 2012. *Shape and spin of near-Earth asteroid 308635 (2005 YU55) from radar images and speckle tracking*, 2012 ACM Meeting, Niigata, Japan.
- Busch, M.W., and 12 colleagues, 2012. *Radar imaging of 11066 Sigurd, 2000 YF29, and 2004 XL14 and the obliquity distribution of contact binary near-Earth asteroids*, 2012 DPS Meeting, Reno, Nevada, USA.
- Busch, M.W., Takahashi, Y., Scheeres, D.J., Benner, L.A.M., Magri, C., Margot, J.L., Nolan, M.C., Giorgini, J.D., 2012. *Internal structure of 4179 Toutatis*, 2012 AGU Fall Meeting, San Francisco, California, USA.
- Busch, M.W., 2013. *Radar observations and the shape and spin of near-Earth asteroid 2008 EV5*, 2013 MarcoPolo-R Mission Workshop, Barcelona, Spain.
- Busch, M.W., Barucci, M.A., Benner, L.A.M., Scheeres, D.J., Giorgini, J.D., 2013. *Near-Earth asteroid 341843 (2008 EV5), Target of ESA's MarcoPolo-R mission*, 2013 IAC Meeting, Beijing, China.
- Busch, M.W., Brozović, M., Benner, L.A.M., Giorgini, J.D., Takahashi, Y., Scheeres, D.J., 2013. *Goldstone/VLA radar observations of near-Earth asteroid 4179 Toutatis in 2012*, 2013 DPS Meeting, Denver, Colorado, USA.
- Busch, M.W., Jacobson, S.A., Benner, L.A.M., Brozović, M., Howell, E.S., Margot, J.L., Naidu, S.P., Shepard, M.K., Taylor, P.A., 2013. *A lower size limit for near-Earth asteroid satellites*, 2013 AGU Meeting, San Francisco, CA, USA.

- Busch, M.W., 2014. *Small asteroid and boulder characterization*, 2014 Applications of Asteroid Redirection Technology Workshop, Keck Institute, Pasadena, CA, USA.
- Busch, M.W., Takahashi, Y., Brozović, M., Benner, L.A.M., Giorgini, J.D., Scheeres, D.J., Jao, J.S., Lee, C.G., Slade, M.A., 2014. *Improved spin-state and shape models of near-Earth asteroid (4179) Toutatis from the 2012 radar observations*, 2014 ACM Meeting, Helsinki, Finland.
- Busch, M.W., 2014. *Space- and Ground-Based Astronomical Characterization of Near-Earth Asteroids*, CAS-NAS Forum for New Leaders in Space Science, Irvine, CA, USA.
- Busch, M.W., 2014. *Radar and near-Earth asteroid exploration missions*, 2014 SSERVI Exploration Science Forum, Mountain View, California, USA.
- Busch, M.W., Benner, L.A.M., Brozović, M., Nolan, M.C., Springmann, A., Taylor, P.A., 2014. *Recent radar speckle observations of near-Earth asteroids*, 2014 DPS Meeting, Tucson, Arizona, USA.
- Busch, M.W., 2015. *Bistatic radar imaging of NEOs*, AstroRecon Workshop, Phoenix, Arizona, USA.
- Busch, M.W., Benner, L.A.M., Slade, M.A., Teitelbaum, L., Brozović, M., Nolan, M.C., Taylor, P.A., Ghigo, F.D., Ford, J., 2015. *High-resolution radar imaging of potentially hazardous near-Earth asteroids*, 2015 Planetary Defense Conference, Frascati, Italy.
- Busch, M.W., 2015. *Bistatic radar observations with large radio telescopes*, Future of Planetary Radio Astronomy Workshop, Green Bank, West Virginia, USA.
- Busch, M.W., and 11 colleagues, 2015. *Asteroids with tensile strength: the case of 2015 HM10*, 2015 DPS Meeting, National Harbor, Maryland, USA.
- Busch, M.W. 2015. *Asteroid missions for science, planetary defense, and human exploration*, CAS-NAS Forum for New Leaders in Space Science, Shanghai, China.
- Busch, M.W. 2016. *Internal structures of near-Earth asteroids from ground- and space-based observations*, CAS-NAS Forum for New Leaders in Space Science, Irvine, California, USA.
- Busch, M.W., Benner, L.A.M., Naidu, S.P., Brozović, M., Taylor, P.A., Rivera-Valentín, E.G., Richardson, J.E., Virkki, A.K., Giorgini, J.D., 2016. *Recent radar observations of potentially hazardous near-Earth asteroids with the Arecibo Observatory and the Deep Space Network*, 2016 AGU Fall Meeting, San Francisco, California, USA.
- Busch, M.W., Benner, L.A.M., Nolan, M.C., Ostro, S.J., Margot, J.L., Magri, C., Giorgini, J.D., Pravec, P., 2017. *Arecibo radar characterization of 138971 (2001 CB21), a flyby target for the DART spacecraft*, 5th IAA Planetary Defense Conference, Tokyo, Japan.
- Busch, M.W., Rožek, A., Marshall, S.E., Young, G., Cobb, A., Raïssi, C., Gal, Y., Benner, L.A.M., Naidu, S.P., Brozović, M., Taylor, P.A., 2018. *Automating asteroid shape modeling from radar images*, 42nd COSPAR Assembly, Pasadena, California USA.
- Abell, P., and 13 colleagues, 2013. *The Mission Accessible Near-Earth Objects Survey (MANOS)*, 2013 DPS Meeting, Denver, CO, USA.
- Benner, L.A.M., Ostro, S.J., Giorgini, J.D., Busch, M.W., Rose, R., Jao, J.S., Jurgens, R.F., 2006. *Radar Observations of Asteroid 2004 XP14: an Outlier in the Near-Earth Population*, 2006 DPS Meeting, Pasadena, CA, USA.
- Benner, L.A.M., and 11 colleagues, 2007. *Radar images of binary near-Earth asteroid 2006 VV2*, 2007 DPS Meeting, Orlando, FL, USA.

- Benner, L.A.M., Nolan, M.C., Margot, J.L., Brozović, M., Ostro, S.J., Shepard, M.K., Magri, C., Giorgini, J.D., Busch, M.W., 2008. *Arecibo and Goldstone radar imaging of contact binary asteroids*, 2008 DPS Meeting, Cornell, NY, USA.
- Benner, L.A.M., and 13 colleagues, 2009. *Arecibo and Goldstone radar images of near-Earth asteroid (136849) 1998 CS1*, 2009 DPS Meeting, Fajardo, Puerto Rico, USA.
- Benner, L.A.M., and 11 colleagues, 2012. *Arecibo and Goldstone radar observations of binary near-Earth asteroid and Marco Polo-R mission target (175706) 1996 FG3*, 2012 DPS Meeting, Reno, Nevada, USA; 2013 MarcoPolo-R Mission Workshop, Barcelona, Spain.
- Benner, L.A.M., Brozović, M., Giorgini, J.D., Jao, J.S., Lee, C.G., Busch, M.W., Slade, M.A., 2013. *Goldstone radar images of near-Earth asteroid 2012 DA14*, 2013 DPS Meeting, Denver, CO, USA.
- Benner, L.A.M., and 11 colleagues, 2014. *Arecibo and Goldstone radar evidence for boulders on near-Earth asteroids*, 2014 ACM Meeting, Helsinki, Finland.
- Benner, L.A.M., and 16 colleagues, 2014. *Goldstone and Arecibo radar images of near-Earth asteroid 2014 HQ124*, 2014 DPS Meeting, Tucson, AZ, USA.
- Benner, L.A.M., and 10 colleagues, 2015. *Radar imaging of binary near-Earth asteroid (357439) 2004 BL86*, 2015 DPS Meeting, National Harbor, Maryland, USA.
- Benner, L.A.M., Brozović, M., Naidu, S.P., Giorgini, J.D., Busch, M.W., Jao, J.S., Lee, C.G., Ghigo, F.D., Snedeker, L.G., Silva, M.A., 2018. *Radar observations of near-Earth asteroid 2012 TC4*, 42nd COSPAR Assembly, Pasadena, California, USA.
- Benner, L.A.M., and 10 colleagues, 2018. *Goldstone/Green Bank radar imaging of near-Earth asteroid 2012 TC4*, 2018 DPS Meeting, Knoxville, Tennessee, USA.
- Brauer, K., Busch, M.W., Benner, L.A.M., Brozović, M., Howell, E.S., Nolan, M.C., Springmann, A., Giorgini, J.D., Taylor, P.A., Jao, J.S., 2015. *The shape of near-Earth asteroid 275677 (2000 RS11) from inversion of Arecibo and Goldstone radar images*, 2015 DPS Meeting, National Harbor, Maryland, USA.
- Brozović, M., and 11 colleagues, 2010. *Radar images and shape model of a triple asteroid (136617) 1994 CC*, 2010 DPS Meeting, Pasadena, California, USA.
- Brozović, M., Benner, L.A.M., Busch, M.W., Giorgini, J.D., Magri, C., 2013. *Goldstone radar imaging and shape modeling of near-Earth asteroid (214869) 2007 PA8*, 2013 DPS Meeting, Denver, Colorado, USA.
- Brozović, M., and 11 colleagues, 2014. *Radar investigations of near-Earth asteroids at Arecibo and Goldstone*, 2014 ACM Meeting, Helsinki, Finland.
- Brozović, M., and 12 colleagues, 2014. *Radar evidence for diverse shapes of the primaries among binary near-Earth asteroids*, 2014 DPS Meeting, Tucson, Arizona, USA.
- Brozović, M., and 13 colleagues, 2015. *Size estimate of (99942) Apophis based on radar imaging*, 2015 DPS Meeting, National Harbor, Maryland, USA.
- Brozović, M., and 15 colleagues, 2016. *Population trends of binary near-Earth asteroids based on radar and lightcurve observations*, 2016 DPS Meeting, Pasadena, CA, USA.
- Brozović, M., and 14 colleagues, 2017. *Goldstone and Arecibo radar observations of (99942) Apophis in 2012-2013*, 5th IAA Planetary Defense Conference, Tokyo, Japan.
- Brozović, M., and 10 colleagues, 2017. *Goldstone radar images of near-Earth asteroids (469896) 2007 WV4, 2014 JO25, 2017 BQ6, and 2017 CS*, 2017 DPS Meeting, Provo, Utah, USA.
- Brozović, M., and 17 colleagues, 2018. *Goldstone radar observations of triple near-Earth asteroid 3122 Florence*, 42nd COSPAR Assembly, Pasadena, California, USA.

- Brozović, M., and 10 colleagues, 2018. *Goldstone and lightcurve observations of radar-bright binary near-Earth asteroids 2018 EB*, 2018 DPS Meeting, Knoxville, Tennessee, USA.
- Brozović, M., Benner, L.A.M., Nolan, M.C., Giorgini, J.D., Naidu, S.P., Taylor, P.A., Busch, M.W., Farnocchia, D., 2019. *Goldstone and Arecibo radar observations of (99942) Apophis in 2021 and 2029*, 6th IAA Planetary Defense Conference, Washington, DC USA
- Cook, A.M., and 16 colleagues, 2006. *SCREAM (Subsurface Characterization Rover for Exobiology Assessment on Mars)*, 2006 DPS Meeting, Pasadena, California, USA; 2006 Fall AGU Meeting, San Francisco, California, USA; 2007 EGU Conference, Vienna, Austria.
- Duong, N.T., Busch, M.W., 2017. *Shape modeling and boulder mapping of asteroid 1992 UY4*, 229th AAS Meeting, Grapevine, Texas, USA.
- Giorgini, J.D., Benner, L.A.M., Ostro, S.J., Nolan, M.C., Busch, M.W., 2007. *The Earth encounters of Apophis in 2029 and 2036*, 2007 DPS Meeting, Orlando, Florida, USA.
- Heavens, N.G., McEwan, I.J., Busch, M.W., Newman, C.E., Richardson, M.I., 2007. *Modeling and implications of exotic martian radio emission*, 2007 DPS Meeting, Orlando, Florida, USA.
- Howell, E.S., and 11 colleagues, 2013. *Using a radar shape model to interpret spectral observations of near-Earth asteroid 4179 Toutatis*, 2013 DPS Meeting, Denver, Colorado, USA.
- Howell, E.S., and 11 colleagues, 2014. *Radar characterization of asteroids and comets*, 2014 ACM Meeting, Helsinki, Finland.
- Lim, L.F., Emery, J.P., Moskovitz, N.A., Busch, M.W., Yang, B., Granvik, M., 2012. *The near-Earth encounter of asteroid 308635 (2005 YU55): thermal IR observations*, 2012 DPS Meeting, Reno, Nevada, USA.
- Marshall, S.E., and 15 colleagues, 2014. *Near-Earth asteroid (137032) 1998 UO1: Shape model and thermal properties*, 2014 ACM Meeting, Helsinki, Finland.
- Marshall, S.E., and 27 colleagues, 2015. *Potentially hazardous asteroid (85989) 1999 JD6: Radar, infrared, and lightcurve observations and a preliminary shape model*, 2015 DPS Meeting, National Harbor, Maryland, USA.
- Marshall, S.E., Cobb, A., Raïssi, C., Gal, Y., Rožek, A., Busch, M.W., Young, G., McGlasson, R., 2018. *Using Bayesian optimization to find asteroids' pole directions*, 2018 DPS Meeting, Knoxville, Tennessee, USA.
- Naidu, S.P., Margot, J.L., Busch, M.W., Taylor, P.A., Nolan, M.C., Howell, E.S., Giorgini, J.D., Benner, L.A.M., Brozović, M., Magri, C., 2011. *Binary near-Earth asteroid 2000 DP107: Component shapes, mutual orbit, and evolution*, 2011 EPSC-DPS Joint Meeting, Nantes, France.
- Naidu, S.P., Margot, J.L., Taylor, P.A., Nolan, M.C., Brozović, M., Benner, L.A.M., Giorgini, J.D., Howell, E.S., Busch, M.W., Magri, C., 2012. *Radar observations and shape modeling of near-Earth asteroid (162421) 2000 ET70*, 2012 DPS Meeting, Reno, Nevada, USA.
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