

Anton Ivanovich Ermakov

Assistant Research Scientist, Space Sciences Laboratory, University of California, Berkeley

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Research Interests

Planetary Geophysics, Geodesy, Geodynamics, Normal Mode Seismology, Celestial Mechanics

I am interested in the formation and evolution of the Solar System bodies and the ways we can constrain planetary interiors by geophysical measurements.

Education

2011-2016 MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA, USA

Degree: Doctor of Philosophy in Planetary Science, awarded in February 2017

Department: Earth, Atmospheric and Planetary Sciences.

Advisor: Dr. Maria T. Zuber

Thesis: Geophysical Investigation of Vesta, Ceres and the Moon using gravity and topography data

2005-2010 MOSCOW STATE UNIVERSITY OF GEODESY AND CARTOGRAPHY, MOSCOW, RUSSIA

Degree: Engineer in Space Geodesy (red diploma)

Department: Geodesy

Advisor Dr. Igor I. Krasnorylov

Thesis: Using GNSS for satellite navigation

Academic Positions

2021– Assistant Research Scientist, Space Sciences Laboratory, University of California, Berkeley

2019–2021 Post-doctoral Researcher at the University of California, Berkeley.

2016–2019 Post-doctoral Scholar at the Jet Propulsion Laboratory, California Institute of Technology

2011–2016 Research Assistant, Department of the Earth, Atmospheric and Planetary Sciences at the Massachusetts Institute of Technology.

2005–2010 Research Assistant at the Moscow State University of Geodesy and Cartography.

Work experience

2009 Hydrographer at PGS-Khazar. Navigation of seismic vessels with DGPS in the Caspian Sea, preprocessing of seismic survey.

2008 Geodesist at Stroy-Decor, Moscow, Russia. Geodetic control of the Vnukovo-3 airport terminal construction.

2007 Geodesist at Geometer-Center, Moscow, Russia. Topographic survey, monitoring of structure deformations.

Funded research grants

- 2020-2023 Science-PI of a NASA grant 19-DDAP19_2-0021: "Mapping Mercury's lithospheric thickness"
- 2019-2021 Science-PI of a NASA grant 18-DDAP18_2-0009: "Constraining Ceres' subsurface structure at geological landmarks using the Dawn gravity and shape data"
- 2019-2022 Co-I of a NASA grant 18-SSW18-239: "Thermal tidal tomography of the Venus atmosphere"
- 2019-2020 Collaborator on a NASA grant 18-PMCS18-0051: "Assessing Dwarf Planet Ceres' Past and Present Habitability Potential"

Research experience

- 2021- Juno Mission Participating Scientist
- 2011-2018 Dawn Science Team Member
- 2017 Gravity anomaly mapping at the Brushy Creek purported impact feature in Louisiana (with Dr. Peter B. James).
- 2011-2016 GRAIL and LOLA science teams on data analysis and calibration.
- 2014 JPL Visiting Student Researcher Program, Solar System Dynamics Group. Analysis of the line-of-sight accelerations from GRAIL.
- 2014 Surface photometry of the nearby galaxies under supervision of Dr. Deidre Hunter at the Lowell Observatory.

Research Publications

- [1] Gomez Casajus, L., **Ermakov, A.I.**, Zannoni, M., Keane, J.T., Stevenson, D., Buccino, D.R., Durante, D., Parisi, M., Park, R.S, Tortora, P., and Bolton, S.J. The gravity field of Ganymede after the Juno's Extended Mission. *Geophysical Research Letters*, in review, 2022.
- [2] **Ermakov, A.I.** and Raymond, C.A. Geophysics of Vesta and Ceres. *Vesta and Ceres. Insights from the Dawn Mission for the Origin of the Solar System*, page 173, 2022.
- [3] Castillo-Rogez, J., Neveu, M., Vinogradoff, V., Miller, M.E., Sori, M.M., Tosi, F., Schmidt, B., Scully, J.E.C, Melwani Daswani, M., Hughson, K., **Ermakov, A.I.**, et al. Science drivers for the future exploration of Ceres: From Solar System evolution to ocean world science. *The Planetary Science Journal*, 3(3):64, 2022.
- [4] Castillo-Rogez, J., Brophy, J., Miller, K., Sori, M.M, Scully, J.E.C, Quick, L., Grimm, R., Zolensky, M., Bland, M., Buczkowski, B., **Ermakov, A.I.**, et al. Concepts for the future exploration of dwarf planet Ceres' habitability. *The Planetary Science Journal*, 3(2):41, 2022.
- [5] Akiba, R., **Ermakov, A.I.**, and Militzer, B. Probing the icy shell structure of ocean worlds with gravity-topography admittance. *The Planetary Science Journal*, 3(3):53, 2022.
- [6] **Ermakov, A.I.**, Park, R.S., Roa, J, Castillo-Rogez, J.C., Keane, J.T., Nimmo, F., Kite, E., et al. A recipe for the geophysical exploration of Enceladus. *The Planetary Science Journal*, 2(4):157, 2021.

- [7] Hunter, D.A., Elmegreen, B.G., Goldberger, E., Taylor, H., **Ermakov, A.I.**, Herrmann, K.A., S. Oh, Malko, B., Barandi, B., and Jundt, R. Relationships between the stellar, gaseous, and star formation disks in little things dwarf irregular galaxies: Indirect evidence for substantial fractions of dark molecular gas. *The Astronomical Journal*, 161, 2021.
- [8] Cartwright, R.J., Beddingfield, C.B., Nordheim, T.A., Elder, C.M., Castillo-Rogez, J.C., Neveu, M., Bramson, A.M., Sori, M.M., Buratti, B.J., Pappalardo, R.T., Roser, J.E., Cohen, I.J., Leonard, E.J., **Ermakov, A.I.**, Showalter, M.R., Grundy, W.M., Turtle, E.P., and Hofstadter, M.D. The science case for spacecraft exploration of the Uranian satellites: Candidate ocean worlds in an ice giant system. *in press, Planetary Science Journal*, 2021.
- [9] Viswanathan, V., Mazarico, E., Merkowitz, S., Williams, J.G., Turyshev, S.G., Currie, D.G., **Ermakov, A.I.**, Rambaux, N., Fienga, A., Courde, C., et al. Extending science from lunar laser ranging. *arXiv:2008.09584, white paper submitted to Planetary Science and Astrobiology Decadal Survey 2023-2032*, 2020.
- [10] Raymond, C.A., **Ermakov, A.I.**, Castillo-Rogez, J.C., Marchi, S., Johnson, B.C., Hesse, M.A., Scully, J.E.C., Buczkowski, D.L., Sizemore, H.G., Schenk, P.M., et al. Impact-driven mobilization of deep crustal brines on dwarf planet Ceres. *Nature Astronomy*, 4(8):741–747, 2020.
- [11] Park, R.S., Riedel, J.E., **Ermakov, A.I.**, Roa, J., Castillo-Rogez, J.C., Davies, A.G., McEwen, A.S., and Watkins, M.M. Advanced Pointing Imaging Camera (APIC) for Planetary Science and Mission Opportunities. *Planetary and Space Science*, 2020.
- [12] Park, R.S., Konopliv, A.S., **Ermakov, A.I.**, Castillo-Rogez, J.C., Fu, R.R., Hughson, K.H.G., Prettyman, T.H., Raymond, C.A., Scully, J.E.C., Sizemore, H.G., et al. Evidence of non-uniform crust of Ceres from Dawn’s high-resolution gravity data. *Nature Astronomy*, 4(8):748–755, 2020.
- [13] Konopliv, A.S., Park, R.S., and **Ermakov, A.I.** The Mercury gravity field, orientation, Love number, and ephemeris from the MESSENGER radiometric tracking data. *Icarus*, 335:113386, 2020.
- [14] James, P.B., **Ermakov, A.I.**, and Michael, M.M. Requirements for gravity measurements on the anticipated Artemis III mission. *arXiv:2009.03514*, 2020.
- [15] J. Castillo-Rogez, M. Neveu, J. Scully, C. House, L. Quick, A. Bouquet, K. Miller, M. Bland, M. De Sanctis, **Ermakov, A.I.**, et al. Ceres: Astrobiological target and possible ocean world. *Astrobiology*, 2020.
- [16] Cartwright, R.J., Beddingfield, C.B., Nordheim, T., Elder, C., Grundy, W., Bramson, A., Sori, M., Pappalardo, R., Neveu, M., Burr, D., **Ermakov, A.I.**, et al. The science case for spacecraft exploration of the uranian satellites. *arXiv preprint arXiv:2007.07284, white paper submitted to Planetary Science and Astrobiology Decadal Survey 2023-2032*, 2020.
- [17] Bills, B.G., Navarro, T., Schubert, G., **Ermakov, A.I.**, and Górski, K.M. Gravitational signatures of atmospheric thermal tides on venus. *Icarus*, 340:113568, 2020.
- [18] Park, R.S., de Kleer, K., McEwen, A., Bierson, C.J., Davies, A.G., DellaGiustina, D., **Ermakov, A.I.**, Fuller, J., Hamilton, C., Harris, C., et al. Tidal heating: Lessons from Io and the Jovian system (report from the KISS workshop). 2019.
- [19] Keane, J.T. and **Ermakov, A.I.** No evidence for true polar wander of Ceres. *Nat. Geosci.*, 12:972–974, 2019.
- [20] Castillo-Rogez, J.C., Hesse, M.A., Formisano, M., Sizemore, H., Bland, M.T., **Ermakov, A.I.**, and Fu, R.R. Conditions for the long-term preservation of a deep brine reservoir in Ceres. *Geophysical Research Letters*, 2019, <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2018GL081473>.

- [21] Bland, M.T., Buczkowski, D.L., Sizemore, H.G., **Ermakov, A.I.**, King, S.D., Sori, M.M., Raymond, C.A., Castillo-Rogez, J.C., and Russell, C.T. Dome formation on Ceres by solid-state flow analogous to terrestrial salt tectonics. *Nature Geoscience*, 12(10):797–801, 2019.
- [22] Bills, B.G. and **Ermakov, A.I.** Simple models of error spectra for planetary gravitational potentials as obtained from a variety of measurement configurations. *Planetary and Space Science*, page 104744, 2019.
- [23] Bills, B.G., Navarro, T., Schubert, G., **Ermakov, A.I.**, and Górski, K.M. Gravitational signatures of atmospheric thermal tides on Venus. *Icarus*, page 113568, 2019.
- [24] **Ermakov, A.I.**, Park, R.S., and Bills, B.G. Power laws of topography and gravity spectra of the Solar System bodies. *Journal of Geophysical Research: Planets*, 123(8):2038–2064, 2018.
- [25] **Ermakov, A.I.**, Kreslavsky, M.A., Scully, J.E.C., Hughson, K.H.G., and Park, R.S. Surface roughness and gravitational slope distributions of Vesta and Ceres. *Journal of Geophysical Research: Planets*, 123, 2018.
- [26] Scully, J.E.C., Russell, C.T., Castillo-Rogez, J.C., Raymond, C.A., and **Ermakov, A.I.** Introduction to the special issue: The formation and evolution of Ceres' Occator crater. *Icarus*, 2018.
- [27] Park, R.S., Vaughan, A.T., Konopliv, A.S., **Ermakov, A.I.**, Mastrodemos, N., Castillo-Rogez, J.C., Joy, S.P., Nathues, A., Polansky, C.A., Rayman, M.D., et al. High-resolution shape model of Ceres from stereophotoclinometry using Dawn imaging data. *Icarus*, 319:812–827, 2018.
- [28] Bland, M.T., **Ermakov, A.I.**, Raymond, C.A., Williams, D.A., Bowling, T.J., Preusker, F., Park, R.S., Marchi, S., Castillo-Rogez, J.C., Fu, R.R., et al. Morphological indicators of a mascon beneath Ceres' largest crater, Kerwan. *Geophysical Research Letters*, 2018.
- [29] Williams, D.A., Kneissl, T., Neesemann, A., Mest, S.C., Palomba, E., Platz, T., Nathues, A., Longobardo, A., Scully, J.E.C., **Ermakov, A.I.**, et al. The geology of the Kerwan quadrangle of dwarf planet Ceres: Investigating Ceres' oldest, largest impact basin. *Icarus*, 2017.
- [30] **Ermakov, A.I.**, Mazarico, E., Schroder, S.E., Carsenty, U., Schorghofer, N., Preusker, F., Raymond, C.A., Russell, C.T., and Zuber, M.T. Ceres's obliquity history and its implications for the permanently shadowed regions. *Geophysical Research Letters*, 44(6):2652–2661, 2017.
- [31] **Ermakov, A.I.**, Fu, R.R., Castillo-Rogez, J.C., Raymond, C.A., Park, R.S., Preusker, F., Russell, C.T., Smith, D.E., and Zuber, M.T. Constraints on Ceres' internal structure and evolution from its shape and gravity measured by the Dawn spacecraft. *Journal of Geophysical Research: Planets*, 122(11):2267–2293, 2017.
- [32] Sori, M.M., Byrne, S., Bland, M.T., Bramson, A.M., **Ermakov, A.I.**, Hamilton, C.W., Otto, K.A., Ruesch, O., and Russell, C.T. The vanishing cryovolcanoes of Ceres. *Geophysical Research Letters*, 44(3):1243–1250, 2017.
- [33] Scully, J.E.C., Buczkowski, D.L., Schmedemann, N., Raymond, C.A., Castillo-Rogez, J.C., King, S.D., Bland, M.T., **Ermakov, A.I.**, O'Brien, D.P., Marchi, S., et al. Evidence for the interior evolution of Ceres from geologic analysis of fractures. *Geophysical Research Letters*, 44(19):9564–9572, 2017.
- [34] J. Scully, Buczkowski, D.L., Neesemann, A., Williams, D.A., Mest, S.C., Raymond, C.A., Nass, A., Hughson, K.H.G., Kneissl, T., Pasckert, J.H., Ruesch, O., Frigeri, A., Marchi, S., Combe, J.-P., Schmedemann, N., Schmidt, B.E., Chilton, H.T., Russell, C.T., Jaumann, R., Preusker, F., Roatsch, T., Hoffmann, M., Nathues, A., Schaefer, M., and **Ermakov, A.I.** Ceres' Ezinu quadrangle: a heavily cratered region with evidence for localized subsurface water ice and the context of Occator crater. *Icarus*, 2017.

- [35] Landis, M.E., Byrne, S., Schorghofer, N., Schmidt, B.E., Hayne, P.O., Castillo-Rogez, J.C., Sykes, M.V., Combe, J.-P., **Ermakov, A.I.**, Prettyman, T.H., Raymond, C.A., and Russell, C.T. Conditions for sublimating water ice to supply Ceres' exosphere. *Journal of Geophysical Research: Planets*, 2017. 2017JE005335.
- [36] Konopliv, A.S., Park, R.S., Vaughan, A.T., Bills, B.G., Asmar, S.W., **Ermakov, A.I.**, Rambaux, N., Raymond, C.A., Castillo-Rogez, J.C., Russell, C.T., et al. The Ceres gravity field, spin pole, rotation period and orbit from the dawn radiometric tracking and optical data. *Icarus*, 2017.
- [37] Hughson, K.H.G., Russell, C.T., Williams, D.A., Buczkowski, D.L., Mest, S.C., Pasckert, J.H., Scully, J.E.C., Combe, J.-P., Platz, T., Ruesch, O., Preusker, F., Jaumann, R., Nass, A., Roatsch, T., Nathues, A., Schaefer, M., Schmidt, B.E., Chilton, H.T., **Ermakov, A.I.**, Singh, S., McFadden, L.A., and Raymond, C.A. The Ac-5 (Fejokoo) quadrangle of Ceres: Geologic map and geomorphological evidence for ground ice mediated surface processes. *Icarus*, 2017.
- [38] Fu, R.R., **Ermakov, A.I.**, Marchi, S., Castillo-Rogez, J.C., Raymond, C.A., Hager, B.H., Zuber, M.T., King, S.D., Bland, M.T., De Sanctis, M.C., et al. The interior structure of Ceres as revealed by surface topography. *Earth and Planetary Science Letters*, 476:153–164, 2017.
- [39] Russell, C.T., Raymond, C.A., Ammannito, E., Buczkowski, D.L., De Sanctis, M.C., Hiesinger, H., Jaumann, R., Konopliv, A.S., McSween, H.Y., Nathues, A., **Ermakov, A.I.**, et al. Dawn arrives at Ceres: Exploration of a small, volatile-rich world. *Science*, 353(6303):1008–1010, 2016.
- [40] Park, R.S., Konopliv, A.S., Bills, B.G., Rambaux, N., Castillo-Rogez, J.C., Raymond, C.A., Vaughan, A.T., **Ermakov, A.I.**, Zuber, M.T., Fu, R.R., et al. A partially differentiated interior for (1) Ceres deduced from its gravity field and shape. *Nature*, 537(7621):515–517, 2016.
- [41] Marchi, S., **Ermakov, A.I.**, Raymond, C.A., Fu, R.R., O'Brien, D.P., Bland, M.T., Ammannito, E., De Sanctis, M.C., Bowling, T., Schenk, P., et al. The missing large impact craters on Ceres. *Nature communications*, 7, 2016.
- [42] Hiesinger, H., Marchi, S., Schmedemann, N., Schenk, P., Pasckert, J.H., Neesemann, A., O'Brien, D.P., Kneissl, T., **Ermakov, A.I.**, Fu, R.R., et al. Cratering on Ceres: Implications for its crust and evolution. *Science*, 353(6303):aaf4759, 2016.
- [43] Buczkowski, D.L., Schmidt, B.E., Williams, D.A., Mest, S.C., Scully, J.E.C., **Ermakov, A.I.**, Preusker, F., Schenk, P., Otto, K.A., Hiesinger, H., et al. The geomorphology of Ceres. *Science*, 353(6303):aaf4332, 2016.
- [44] **Ermakov, A.I.**, Zuber, M.T., Smith, D.E., Raymond, C.A., Balmino, G., Fu, R.R., and Ivanov, B.A. Constraints on Vesta's interior structure using gravity and shape models from the Dawn mission. *Icarus*, 240:146–160, 2014.
- [45] Konopliv, A.S., Asmar, S.W., Park, R.S., Bills, B.G., Centinello, F., Chamberlin, A.B., **Ermakov, A.I.**, Gaskell, R.W., Rambaux, N., Raymond, C.A., et al. The Vesta gravity field, spin pole and rotation period, landmark positions, and ephemeris from the Dawn tracking and optical data. *Icarus*, 240:103–117, 2014.
- [46] Fu, R.R., Hager, B.H., **Ermakov, A.I.**, and Zuber, M.T. Efficient early global relaxation of asteroid Vesta. *Icarus*, 240:133–145, 2014.
- [47] Blewett, D.T., Buczkowski, D.L., Ruesch, O., Scully, J.E.C., O'Brien, D.P., Gaskell, R., Roatsch, T., Bowling, T.J., **Ermakov, A.I.**, Hiesinger, H., et al. Vesta's north pole quadrangle Av-1 (Albana): Geologic map and the nature of the south polar basin antipodes. *Icarus*, 244:13–22, 2014.

- [48] Currie, D., Dell’Agnello, S., Delle Monache, G.O., Behr, B., and **Ermakov, A.I.** Next generation lunar laser retroreflector. In *Annual Meeting of the Lunar Exploration Analysis Group*, volume 1748, page 7042, 2013.
- [49] **Ermakov, A.I.** Using GNSS for satellite navigation. *Journal of Geodesy and Aerophotosurveying*, 3:49–51, 2010.
- [50] **Ermakov, A.I.** The effect of Mars on the orbit evolution of the near-earth asteroids. *Journal of Geodesy and Aerophotosurveying*, 3:47–49, 2010.

Conferences*

**only first-author presentations*

- 2022 Ermakov, A.I., Bills, B.G., Navarro, T., Schubert, G., Gorski, K. Harmonic Analysis of Venus’ Thermal Tide. *Lunar and Planetary Science Conference*, The Woodlands, TX, USA.
- 2022 Ermakov, A.I., Johnson, B.C., Park, R.S., Castillo-Rogez, J.C. Formation of Ceres’ Mascons. *Lunar and Planetary Science Conference*, The Woodlands, TX, USA.
- 2021 Ermakov, A.I., Shi, J., de Hoop, M.V., Militzer, B., Faucher, F. Non-perturbative computation of normal modes for rotating gas giant planets. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
- 2020 Ermakov, A.I., Castillo-Rogez, J.C., Park, R.S., Sotin, S., Lazio, J., Howell, S.M., Keane, J.T., Hemingway, D.J., Nimmo, F., Kite, E., Viswanathan, V., Steinbrügge, G., Tobie, G., Lainey, V. A recipe for geophysical investigation of Enceladus. *AAS/DPS Virtual Meeting*.
- 2019 Ermakov, A.I., Park, R.S., Fu, R.R., Raymond, C.A., Castillo-Rogez, J.C., Russell, C.T. Ceres’ interior from Dawn’s second extended mission gravity mapping. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
- 2019 Ermakov, A.I., Park, R.S., Raymond, C.A., Castillo-Rogez, J.C., Russell, C.T. Using effective density spectrum to constrain crustal density profile of Vesta and Ceres. *Lunar and Planetary Science Conference*, The Woodlands, TX, USA.
- 2018 Ermakov, A.I., Bills, B.G., Navarro, T., Schubert, G., Gorski, K. Decomposition of the Venus time-variable gravity due to the atmospheric mass motion as inferred from global circulation models. *American Geophysical Union Fall Meeting*, Washington D.C., USA.
- 2018 Ermakov, A.I., Park, R.S., Raymond, C.A., Castillo-Rogez, J.C., Russell, C.T. Roughness of Ceres from high-resolution shape models. *42nd COSPAR Assembly*, Pasadena, CA, USA.
- 2017 Ermakov, A.I., Park, R.S., Raymond, C.A., Zuber, M.T., Russell, C.T., Fu, R.R. Insights into Vesta and Ceres internal structures from their topography. Invited talk at the *American Geophysical Union Fall Meeting*, New Orleans, LA, USA.
- 2017 Ermakov, A.I., Park, R.S., Bills, B.G., Power laws of gravity and topography of Solar System bodies. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
- 2017 Ermakov, A.I., Fu, R.R., Zuber, M.T., Smith, D.E., Park, R.S., Raymond, C.A., Russell, C.T. Comparative study of Vesta and Ceres using the Dawn gravity and shape data. *Asteroids, Comets, Meteors Meeting*, Montevideo, Uruguay.
- 2017 Ermakov, A.I., Fu, R.R., Zuber, M.T., Smith, D.E., Park, R.S., Raymond, C.A., Russell, C.T. Regional analysis of Ceres gravity anomalies. *Lunar and Planetary Science Conference*, The Woodlands, TX, USA.

- 2016 Ermakov, A.I., Mazarico, E., Schröder, S., Carsenty, U., Schorghofer, N., Raymond, C.A., Zuber, M.T., Smith, D.E., Russell, C.T. Ceres' obliquity history: Implications for permanently shadowed regions. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
- 2016 Ermakov, A.I., Fu, R.R., Zuber, M.T., Smith, D.E., Park, R.S., Raymond, C.A., Russell, C.T. Evaluation of Ceres' compensation state. *Lunar and Planetary Science Conference*, The Woodlands, TX, USA.
- 2015 Ermakov, A.I., Fu, R.R., Zuber, M.T., Smith, D.E., Park, R.S., Raymond, C.A., Russell, C.T. Constraints on Ceres internal structure and thermal evolution from the Dawn shape and gravity data. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
- 2015 Ermakov, A.I. Zuber, M.T., Smith, D.E., Fu, R.R., Raymond, C.A., Russell, C.T. Constraints on Ceres' internal structure from the Dawn shape and gravity data. *6th Moscow Solar System Symposium*, Moscow, Russia.
- 2015 Ermakov, A.I., Zuber, M.T., Smith, D.E., Park, R.S., Konopliv, A.S., Neumann, G.A. Evaluation of degree-1200 GRAIL gravity models using line-of-sight data and spectral analysis. *Lunar and Planetary Science Conference*, The Woodlands, TX, USA.
- 2014 Ermakov, A.I., Zuber, M.T. Smith, D.E., Raymond, C.A., Preusker, F., Gaskell R. Comparison of SPC and SPG shape models of Vesta. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
- 2014 Ermakov, A.I., Zuber, M.T., Smith, D.E., Raymond, C.A., Fu, R.R., Toplis, M.J. Modeling Vesta's internal structure with Dawn gravity and shape models. *Vesta in the Light of Dawn workshop: First Exploration of a Protoplanet in the Asteroid Belt*, Houston, TX, USA.
- 2013 Ermakov, A.I., Zuber, M.T., Smith, D.E., Raymond, C.A., Fu, R.R., Toplis, M.J. Vesta's interior structure, despinning and reorientation from Dawn. *American Geophysical Union Fall Meeting*, San Francisco, CA, USA.
- 2012 Ermakov, A.I., Zuber, M.T., Raymond, C.A. Forward modeling of Vesta's interior structure using gravity and shape models from the Dawn mission. *Lunar and Planetary Science Conference*, The Woodlands, TX, USA.
- 2010 Ermakov, A.I. Gravitational interference of Mars on the evolution of the orbital elements of Near-Earth Objects. *Undergraduate and Postgraduate Student Conference*, Moscow, Russia.
- 2010 Ermakov, A.I. Estimation of parameters of the Earth's gravitational field using GPS measurements in the GOCE project. *Undergraduate and Postgraduate Student Conference*, Moscow, Russia.
- 2009 Ermakov, A.I. Bagrov, A. High-precision model of the Earth's gravitational field on the basis of the wavelet theory. *Undergraduate and Postgraduate Student Conference*, Moscow, Russia.
- 2009 Ermakov, A.I. Statistical distribution of energy released in the impacts with Near-Earth Objects. *Undergraduate and Postgraduate Student Conference*, Moscow, Russia.
- 2009 Ermakov, A.I. GNSS applications for navigation of satellites. *Undergraduate and Postgraduate Student Conference*, Moscow, Russia.

Invited Talks

- 2022 Stanford geophysics seminar, Stanford, CA, USA
- 2022 UCLA planetary seminar, Los Angeles, CA, USA

- 2021 Baylor University Geophysics Seminar, Waco, TX, USA
- 2020 Berkeley/UCLA planetary science science seminar, Berkeley, CA, USA
- 2020 Planetary lunch seminar at UC Santa Cruz, Santa Cruz, CA, USA
- 2019 CIPS planetary seminar at UC Berkeley, Berkeley, CA, USA
- 2018 UCLA planetary seminar, Los Angeles, CA, USA
- 2018 The Dix Planetary Science Seminar at Caltech, Pasadena, CA, USA
- 2017 Invited speaker at the American Geophysical Union Fall Meeting, New Orleans, USA
- 2017 Invited speaker at the Japan Geoscience Union - American Geophysical Union Joint Meeting, Chiba, Japan
- 2017 Yuk Yang seminar at Caltech, Pasadena, CA, USA
- 2016 Research seminar at the Paris Observatory, Paris, France
- 2016 SSERVI seminar, Brown University, Providence, RI, USA
- 2016 Invited talk at the New Hampshire Astronomy Club, Concord, NH, USA
- 2015 Planetary Informal lunch Colloquium at MIT, Cambridge, MA, USA
- 2014 Invited talk at the University of Arizona, Tucson, AZ, USA
- 2014 Invited talk at the Harvard University, Cambridge, MA, USA
- 2013 Planetary Informal lunch Colloquium at MIT, Cambridge, MA, USA
- 2013 Research talk at the Institute for Space Research, Moscow, Russia
- 2012 Planetary Informal lunch Colloquium at MIT, Cambridge, MA, USA
- 2012 Planetary Informal lunch Colloquium at MIT, Cambridge, MA, USA

Teaching and Mentorship

- 2022 Ryu Akiba (UC Berkeley, Applied Math), joint analysis of Ganymede's geophysical data
- 2022 Aidi Zhang (Lin Fellowship at UCB/SSL), gravity signature of Jupiter's Great Red Spot
- 2020 Ryu Akiba (UC Berkeley, Applied Math), modeling ice shell structure of ocean worlds
- 2014-2016 Leading gravimetry lab for the MIT course 12.002 Introduction to Geophysics & Planetary Science
- 2013-2015 Mentored graduate students Alissa Earle and Zhuchang Zhan
- 2013 Teaching assistant, MIT course 12.420/12.601 Physics & Chemistry of Solar System taught by Dr. Benjamin Weiss

Honors and Awards

- 2019 JPL Team Award for the development the Mercury gravity field model

2016	NASA Group Achievement Award to the Dawn Gravity Team
2012	AGU Outstanding Student Paper Award
2006-2010	Moscow Mayor's scholarship for outstanding students
2009	Honorary Diploma from the Director of Russian Federal Agency of Geodesy and Cartography
2009	Honorary Diploma for excellent academic achievements. Moscow State University of Geodesy and Cartography
2008	Honorary Diploma for excellent academic achievements. Moscow State University of Geodesy and Cartography
2007	Honorary Diploma for excellent academic achievements. Moscow State University of Geodesy and Cartography

Service

2021	EPSC session convener
2020-	Co-lead of Next Generation of Planetary Geodesy KISS workshop, Keck Institute, Caltech.
2020-	Co-organizer of Berkeley-UCLA planetary science seminars
2020	DPS Annual Meeting session chair
2018,2020	AGU Fall Meeting session organizer and chair
2017-	NASA review panelist, multiple programs
2016	Book chapter review: Enceladus and the Icy Moons of Saturn, The University of Arizona Press
2013-	Reviewer for scientific journals: <i>Icarus</i> , <i>Space Science Reviews</i> , <i>Astronomy and Astrophysics</i> , <i>MAPS</i> , <i>Astrophysics and Space Science</i> , <i>Engineering Reports</i> , <i>Journal of Geophysical Research</i> , <i>Geophysical Journal International</i> .

Affiliations

2012-	American Geophysical Union member
2018-	COSPAR associate
2020-	DPS affiliate member

Skills

Geophysical and geodetic equipment: GNSS receivers and antennas, relative gravimeters, geophones, total stations and levels

Astronomical equipment: telescopes, CCD cameras, spectrographs

Programming languages: C/C++, Matlab, Fortran, Python, Mathematica, Julia

Languages: Russian – native, English – fluent, Italian – intermediate, Kazakh – basic

Hobbies: karting, astrophotography, swimming.