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EDUCATION	Ph.D. in Aerospace Engineering Sciences University of Colorado Boulder, USA Advisor: Jay W. McMahon Thesis (draft): <i>Risk-aware Mission Design around Small Celestial Bodies</i>	Spring 2021 (expected)
	M.S. & B.S. in Aeronautics and Astronautics The University of Tokyo, Japan Advisor: Shin-ichi Nakasuka and Ryu Funase	Mar 2017 & Mar 2015
PROFESSIONAL EXPERIENCE	NASA JPL visiting student researcher Outer planet mission analysis group, Mission design and navigation section Supervisors: Gregory Lantoine & Jon Sims	June - Aug 2018
	NASA JPL visiting student researcher Outer planet mission analysis group, Mission design and navigation section Supervisors: Gregory Lantoine & Jon Sims	Sept - Nov 2019
	CCAR graduate research assistant Colorado Center for Astrodynamics Research, University of Colorado Boulder	Aug 2017 - Present
	JSPS DC1 research fellow Japan Society for the Promotion of Science (JSPS)	Apr 2017 - Aug 2017
	JAXA ISAS assistant researcher Institute of Space and Astronautical Science, JAXA	Apr 2015 - Aug 2017
RESEARCH TOPICS	Stochastic optimal control for robust mission design under uncertainty – Combining astrodynamics + stochastic optimal control + optimization for mission design – Related publications: (J1), (J2), (C1), (C2), (C3), (C4), (C5)	Nov 2017 - Present
	Non-Keplerian dynamics around small celestial bodies – Analysis of complex dynamics around small bodies with application to science orbit design – Related publications: (J3), (C7)	Aug 2018 - Present
	Solar Radiation Pressure–based orbit control – Optimal orbit control law & trajectory optimization for solar sailing (interplanetary & small-body environments) – Related publications: (J4), (C6), (C8), (C9)	Aug 2017 - Present
	Solar sail attitude-orbit coupled dynamics modeling & control – Precise modeling & optimal control of attitude-orbit coupled dynamics under sail deformation – Related publications: (C11), (C12), (C13), (C16)	Apr 2015 - Aug 2017
NASA PROJECTS	NEA Scout mission [URL] – NASA CubeSat solar sailing mission to explore Near-Earth Asteroids (NEAs)	Sept - Nov 2019

- Role: Visiting student researcher, *SRP-based Orbit Control for Solar Sailing missions*
- Developed solar sailing trajectory indirect optimization techniques & missed-thrust analysis
- Related publications: to appear

Psyche mission [\[URL\]](#) June - Aug 2018

- NASA discovery mission program (*Psyche: Journey to a Metal World*)
- Role: Visiting student researcher, *Investigating non-Keplerian dynamics around Psyche*
- Analysis of the highly-perturbed dynamics & science orbit design around (16) Psyche
- Related publications: (J3), (C7)

Dismantling rubble pile asteroids with AoES [\[URL\]](#) Aug 2017 - Present

- NASA Innovative Advanced Concepts (NIAC) program (Phase I & II)
- Role: Graduate research assistant
- AoES mission analysis & analytical orbit control law for SRP-based landing on asteroids
- Related publications: (J4), (C9), (C14)

JAXA
PROJECTS

EQUULEUS: Equilibrium Lunar-Earth point 6U Spacecraft [\[URL\]](#) Jan 2016 - Present

- JAXA CubeSat mission to explore cislunar space with low energy transfer
- Role: Project engineer lead & mission designer
- High-level design of mission concept & spacecraft system; design of transfer trajectories & science orbits; station-keeping analysis on EML2 NRHOs
- Related publications: (J5), (J7), (C10)

PROCYON: Proximate Object Close Flyby with Optical Navigation [\[URL\]](#) Apr 2014 - Aug 2017

- JAXA small-sat mission that successfully explored deep space for the first time as a small sat
- Role: Spacecraft Guidance, Navigation & Control (GNC) engineer
- GNC flight data analysis & GNC flight software development
- Related publications: (J6), (J8), (C17)

INDIVIDUAL
AWARDS

AAS GNC conference student paper competition 2nd place [\[URL\]](#) Feb 2020
Awarded for paper *Autonomous Guidance for Robust Achievement of Science Observations around Small Bodies*, from American Astronautical Society Rocky Mountain Section

CCAR Bahls Endowed Funds – Travel Award [\[URL\]](#) Jan 2019
Awarded for paper *Science Orbit Design with Frozen Beta angle: Theory and Application to Psyche mission*, from Colorado Center for Astrodynamics Research

AAS John V. Breakwell student award [\[URL\]](#) Aug 2018
Awarded for paper *SRP-based Orbit Control with Application to Small Body Landing*, from Space Flight Mechanics committee, American Astronautical Society

UTokyo tuition fee half exemption for outstanding students Apr 2017
Awarded from the University of Tokyo.

JSASS outstanding Student Presentation Award Oct 2016
Awarded for paper *Time-optimal Attitude Control with Application to Orbit Control of Spinning Solar Sail Driven by Reflectivity Control*, from Japan Society for Aeronautical and Space Sciences

Travel awards for conference attendance abroad Feb, June, July 2016
Awarded from Ministry of Education, Culture, Sports, Science and Technology, Japan; Tokyo electric power company holdings memorial foundation, Japan; Murata science foundation, Japan

GROUP
AWARDS

Japanese Government MEXT Commendation for Science and Technology Mar 2017

Awarded for PROCYON project team from Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan.

UTokyo University President's Award Mar 2015
Awarded for PROCYON project team from the University of Tokyo.

FELLOWSHIPS **Masason foundation fellowship** FY2017 - FY2021
Awarded from Masason foundation, Japan [\[URL\]](#).

Study abroad fellowship FY2017 - FY2018
Awarded from Nakajima science foundation, Japan [\[URL\]](#).

CU Boulder Aerospace Departmental fellowship Aug 2017
Awarded from University of Colorado Boulder.

JSPS DC1 research fellowship for young scientist Apr - Aug 2017
One of the most prestigious fellowship awarded for Ph.D. students in Japan from Japan Society for the Promotion of Science (*Terminated when leaving the position at UTokyo to start study abroad)

Japanese Government MEXT fellowship Apr 2015 - Mar 2017
Awarded from Ministry of Education, Culture, Sports, Science and Technology, Japan

RESEARCH GRANTS **Research grant for Masason fellows** FY2017, FY2018, FY2019
Awarded from Masason foundation, Japan

JSPS Grants-in-Aid for Scientific Research <KAKENHI> FY2017, FY2018*, FY2019*
Awarded from Japan Society for the Promotion of Science (*Terminated when leaving the position at UTokyo to start study abroad)

JOURNAL PUBLICATIONS

(J1) **K. Oguri** and J. W. McMahon. Stochastic Primer Vector for Robust Low-thrust Trajectory Design under Uncertainty. *Journal of Guidance, Control, and Dynamics*, in preparation

(J2) **K. Oguri** and J. W. McMahon. Robust Spacecraft Guidance around Small Bodies under Uncertainty: Stochastic Optimal Control Approach. *Journal of Guidance, Control, and Dynamics*, under review, 2020

(J3) **K. Oguri**, G. Lantoine, W. Hart, and J. McMahon. Science orbit design with a quasi-frozen beta angle: Effects of body obliquity on J2-perturbed dynamics. *Celestial Mechanics and Dynamical Astronomy*, accepted, 2020

(J4) **K. Oguri** and J. W. McMahon. Solar Radiation Pressure–Based Orbit Control with Application to Small-Body Landing. *Journal of Guidance, Control, and Dynamics*, 43(2):195–211, Feb. 2020. doi: 10.2514/1.G004489

(J5) **K. Oguri**, K. Oshima, S. Campagnola, K. Kakihara, N. Ozaki, N. Baresi, Y. Kawakatsu, and R. Funase. EQUULEUS Trajectory Design. *The Journal of the Astronautical Sciences*, 67(3): 950–976, Sept. 2020. doi: 10.1007/s40295-019-00206-y

(J6) S. Ikari, T. Ito, **K. Oguri**, T. Inamori, S. Sakai, Y. Kawakatsu, A. Tomiki, and R. Funase. In Orbit Demonstration of a FDIR Algorithm for the Attitude Control System of Micro Interplanetary Spacecraft PROCYON. *Journal of the Japan Society for Aeronautical and Space Sciences*, 68 (2):89–95, 2020. doi: 10.2322/jjsass.68.89 (in Japanese)

(J7) S. Campagnola, J. Hernando-ayuso, K. Kakihara, Y. Kawabata, T. Chikazawa, R. Funase, N. Ozaki, N. Baresi, T. Hashimoto, Y. Kawakatsu, T. Ikenaga, **K. Oguri**, and K. Oshima. Mission Analysis for the EM-1 CubeSats EQUULEUS and OMOTENASHI. *IEEE Aerospace and Electronic Systems Magazine*, 34(4):38–44, Apr. 2019. doi: 10.1109/MAES.2019.2916291

(J8) S. Ikari, T. Inamori, T. Ito, K. Ariu, **K. Oguri**, M. Fujimoto, S. Sakai, Y. Kawakatsu, and R. Funase. Attitude Determination and Control System for the PROCYON Micro-Spacecraft.

Transactions of the Japan Society for Aeronautical and Space Sciences, 60(3):181–191, 2017.
doi: 10.2322/tjsass.60.181

SELECTED
CONFERENCE
PROCEEDINGS

- (C1) **K. Oguri** and J. W. McMahon. Stochastic Primer Vector for Robust Impulsive Trajectory Design Under Uncertainty. In *AAS/AIAA Astrodynamics Specialist Conference*, South Lake Tahoe, CA (Virtual), Aug. 2020
- (C2) **K. Oguri** and J. W. McMahon. Autonomous Guidance for Robust Achievement of Science Observations around Small Bodies. In *AAS Guidance, Navigation, and Control conference*, Breckenridge, Colorado, Feb. 2020, **2nd place in AAS GNC conference student paper competition**
- (C3) **K. Oguri**, M. Ono, and J. W. McMahon. Convex Optimization over Sequential Linear Feedback Policies with Continuous-time Chance Constraints. In *2019 IEEE 58th Conference on Decision and Control (CDC)*, pages 6325–6331, Nice, France, Dec. 2019. IEEE. doi: 10.1109/CDC40024.2019.9029604
- (C4) **K. Oguri** and J. W. McMahon. Risk-aware Trajectory Design with Impulsive Maneuvers: Convex Optimization Approach. In *AAS/AIAA Astrodynamics Specialist Conference*, Portland, ME, 2019
- (C5) **K. Oguri** and J. W. McMahon. Risk-aware Trajectory Design with Continuous Thrust: Primer Vector Theory Approach. In *AAS/AIAA Astrodynamics Specialist Conference*, Portland, ME, 2019
- (C6) **K. Oguri** and J. W. McMahon. SRP-based Orbit Control for Asteroid Exploration. In *32nd International Symposium on Space Technology and Science*, Fukui, Japan, 2019
- (C7) **K. Oguri**, G. Lantoine, B. Hart, and J. W. McMahon. Science Orbit Design with Frozen Beta angle: Theory and Application to Psyche mission. In *AAS/AIAA Space Flight Mechanics Meeting*, Ka’anapali, HI, 2019, **Bahls Endowed Funds Travel Award**
- (C8) **K. Oguri** and J. W. McMahon. SRP-based Orbit Control with Application to Orbit Stationkeeping at Small Bodies. In *AAS/AIAA Space Flight Mechanics Meetings Space Flight*, Ka’anapali, HI, 2019,
- (C9) **K. Oguri** and J. W. McMahon. SRP-based Orbit Control with Application to Small Body Landing. In *AAS/AIAA Astrodynamics Specialist Conference*, Snowbird, UT, 2018, **John V. Breakwell student award**
- (C10) **K. Oguri**, K. Kakihara, S. Campagnola, N. Ozaki, K. Oshima, T. Yamaguchi, and R. Funase. EQUULEUS Mission Analysis: Design of the Science Orbit Phase. In *International Symposium on Space Flight Dynamics*, Ehime, Japan, June 2017
- (C11) **K. Oguri**, A. Ishikawa, S. Ikari, T. Kudo, and R. Funase. Precision Evaluation of Reduced Dynamics Model for Non-uniform Spinning Solar Sail Driven by Reflectivity Control. In *4th International Symposium on Solar Sailing, 17045*, Kyoto, Japan, 2017
- (C12) **K. Oguri** and R. Funase. Time-optimal Attitude Control Law with a Strategy of Applying to Orbital Control for Spinning Solar Sail Driven by Reflectivity Control. *Advances in the Astronautical Sciences*, 158:933–951, 2016
- (C13) **K. Oguri**, T. Kudo, and R. Funase. Time-Optimal Attitude Control and its Application to Orbital Control of Spinning Solar Sail Driven by Reflectivity Control. In *60th Space Sciences and Technology Conference, 2016-P34*, Hokkaido, Japan, 2016, **Outstanding student presentation award**
- (C14) J. McMahon, S. K. Mitchell, **K. Oguri**, N. Kellaris, D. Kuettel, C. Keplinger, and B. Bercovici. Area-of-Effect Softbots (AoES) for Asteroid Proximity Operations. In *2019 IEEE Aerospace Conference*, pages 1–16, Big Sky, Montana, Mar. 2019. IEEE. doi: 10.1109/AERO.2019.8741680
- (C15) S. Campagnola, J. Hernando-ayuso, N. Ozaki, N. Baresi, T. Hashimoto, Y. Kawakatsu, K. Kakihara, Y. Kawabata, T. Chikazawa, R. Funase, T. Ikenaga, **K. Oguri**, and K. Oshima. Mission analysis for the EM-1 CubeSats EQUULEUS and OMOTENASHI. In *69th International Astronautical Congress*, 2018
- (C16) A. Ishikawa, **K. Oguri**, S. Ikari, R. Funase, and S. Nakasuka. Estimation of Shape and Optical Parameters of Spinning Solar Sail Equipped with Reflectivity Control Devices. In

- 26th International Symposium on Space Flight Dynamics, pages 1–6, 2017
- (C17) T. Ito, S. Ikari, **K. Oguri**, M. Fujimoto, K. Ariu, Y. Kawabata, T. Inamori, S. Sakai, Y. Kawakatsu, and R. Funase. Preliminary Study of Angular Momentum Control by Solar Radiation Pressure for 50 kg-class Spacecraft PROCYON. In *59th Space Sciences and Technology Conference, 2015-3J08*, pages 1–6, Kagoshima, Japan, 2015, **Young researcher award**

- PRESENTATIONS (P1) “Autonomous Guidance for Robust Achievement of Science Observations around Small Bodies,” at *AAS Guidance, Navigation, and Control conference*, Breckenridge, Colorado, 2020.
- (P2) “Convex Optimization over Sequential Linear Feedback Policies with Continuous-time Chance Constraints,” at *2019 IEEE Conference on Decision and Control*, Nice, France, 2019.
- (P3) “Risk-aware Trajectory Design with Continuous Thrust: Primer Vector Theory Approach,” at *AAS/AIAA Astrodynamics Specialist Conference, AAS 19-912*, Portland, ME, 2019.
- (P4) “Risk-aware Trajectory Design with Impulsive Maneuvers: Convex Optimization Approach,” at *AAS/AIAA Astrodynamics Specialist Conference, AAS 19-893*, Portland, ME, 2019.
- (P5) “SRP-based Orbit Control for Asteroid Exploration”, at *32nd International Symposium on Space Technology and Science, ISTS 2019-d-021*, Fukui, Japan, 2019.
- (P6) “Science Orbit Design with Frozen Beta angle: Theory and Application to Psyche mission”, at *2019 AAS/AIAA Space Flight Mechanics Meeting, AAS 19-269*, Ka’anapali, HI, 2019.
- (P7) “SRP-based Orbit Control with Application to Orbit Stationkeeping at Small Bodies”, at *2019 AAS/AIAA Space Flight Mechanics Meeting, AAS 19-415*, Ka’anapali, HI, 2019.
- (P8) “SRP-based Orbit Control with Application to Small body Landing”, at *2018 AAS/AIAA Astrodynamics Specialist Conference, AAS 18-375*, Snowbird, UT, 2018.
- (P9) “EQUULEUS Mission Analysis: Design of the Science Orbit Phase”, at *26th International Symposium on Space Flight Dynamics, ISSFD-2017-072*, Ehime, Japan, 2017.
- (P10) “Precision Evaluation of Reduced Dynamics Model for Non-uniform Spinning Solar Sail Driven by Reflectivity Control”, at *4th International Symposium on Solar Sailing, ISSS-17045*, Kyoto, Japan, 2017.
- (P11) “Attitude Maneuverability Estimation for Preliminary Mission Design of Spinning Solar Sail Driven by Reflectivity Control” at *the AIAA/AAS Astrodynamics Specialist Conference, AIAA2016-5674*, Long Beach, California, 2016.
- (P12) “Optimal Attitude and Orbital Control Strategy of Spinning Solar Sail Spacecraft via Reflectivity Control” at *26th AAS/AIAA Space Flight Mechanics Meeting, AAS 16-329*, Napa, California, 2016.
- (P13) “On-Orbit Estimation of ADCS Parameters for micro-astrometry satellite ‘Nano-JASMINE’” at *59th Space Sciences and Technology Conference, 2015-3J13*, Kagoshima, Japan, 2015.
- (P14) “Time-Optimal Attitude Control of Spinning Solar Sail by Reflectivity Control” at *25th Workshop on JAXA Astrodynamics and Flight Mechanics, 2015-C-11*, Kanagawa, Japan, 2015.
- (P15) “Optimal Attitude Control of Spinning Solar Sail with Reflectivity Control” at *30th International Symposium on Space Technology and Science, 2015-d-26*, Kobe, Japan, 2015.
- (P16) “Mission Concept and System Design of World-First Cis-Lunar Space Exploration CubeSat EQUULEUS”, at *17th ISAS/JAXA Space Science Symposium, 2016-P-24*, Kanagawa, Japan, 2017.
- (P17) “Time-Optimal Attitude Control and its Application to Orbital Control of Spinning Solar Sail Driven by Reflectivity Control” at *60th Space Sciences and Technology Conference, 2016-P34*, Hokkaido, Japan, 2016. **Outstanding student presentation award**

MISCELLANEOUS **Academic society:** AAS, AIAA, IEEE, SIAM, JSASS
Journal reviewer: AIAA JGCD, ASR
Programming: Python, Matlab, C, C++
Software: SNOPT [\[URL\]](#), CVX [\[URL\]](#), SPICE, Mathematica, GMAT

Last updated: September 8, 2020