David Yaylali

Aerospace Engineering and Theoretical Physics

2300 N. 2nd Ave.
Tucson, AZ 85705
United States

Cell: (847) 917-0971
Email: david.yaylali@gmail.com
Web: www.asthecroworbits.com

Date of Birth: May 2, 1983

US Citizen

Activity and Research Interests

Spacecraft guidance and control systems; orbital mechanics; astroparticle physics

Education

Dec 2018	M.S. Aerospace Engineering (GPA: 4.0) — Adviser: Eric Butcher Aerospace and Mechanical Engineering, University of Arizona, Tucson, AZ Thesis: *Fractional Control of Multivehicle Systems and Relative Orbits*
May 2014	Ph.D. Physics (GPA: 3.9) — Adviser: Jason Kumar Department of Physics, University of Hawaii, Honolulu, HI Thesis: *Multi-Component Dark Matter and Constraints from Dark Sector Instability*
Dec. 2009	M.S. Physics Department of Physics, University of Hawaii, Honolulu, HI
May 2005	B.A. Physics Reed College, Portland, OR Thesis: *Conserved Properties of the Korteweg-de Vries Equation*

Positions Held

2017–2019	Graduate Research Assistant Aerospace and Mechanical Engineering, University of Arizona *Visiting researcher at Air Force Research Lab, Kirtland AFB, Summer 2018*
2014–2017	Postdoctoral Researcher Department of Physics, University of Arizona *Visiting postdoc at University of Maryland, 2014-2015*
2010–2014	Graduate Research Assistant Department of Physics, University of Hawaii
2007–2010	Graduate Teaching Assistant Department of Physics, University of Hawaii
2005–2007	X-Ray Fluorescence (XRF) Applications Engineer Oxford Instruments Measurement Systems, Elk Grove Village, IL ◦ Performed XRF analyses of atomic composition and electroplating thickness.

Technical Skills

- ◦ Environments: Linux, Windows, Mac OS
- ◦ Languages: Mathematica, MATLAB, Python, C++, HTML/CSS, Fortran
- ◦ Typsetting/Presentation: LaTeX, PowerPoint/Impress, Inkscape, gnuplot
- ◦ Experience with optimization algorithms, Monte Carlo methods, object-oriented programming

Selected Publications

1. D. Yaylali, E. Butcher, and A. Sinclair, "Fractional Control Protocols for Linearized Relative Orbit Dynamics," *Proceedings of the 29th AAS/AIAA Space Flight Mechanics Meeting*, Ka'anapali, HI, 2019.

2. D. Yaylali, E. Butcher, and A. Dibiri, "Fractional PID Consensus Control Protocols for Second-Order Multiagent Systems," *Proceedings of the AIAA Guidance, Navigation, and Control Conference*, San Diego, CA, 2019.

(Author lists for the following papers are listed in alphabetical order by convention.)

3. S. In, J. Kumar, C. Rott, and D. Yaylali, "Neutrino Topology Reconstruction at DUNE and Applications to Searches for Dark Matter Annihilation in the Sun," *In preparation.*

4. K. R. Dienes, S. Su, B. Thomas, and D. Yaylali, "Jet Cascades as Signatures of Dynamical Dark Matter," *In Preparation.*

5. K. R. Dienes, J. Kumar, B. Thomas, and D. Yaylali, "Off-diagonal dark-matter phenomenology: Exploring enhanced complementarity relations in nonminimal dark sectors," Phys. Rev. D **96**, 115009 (2017) [arXiv:1708.09698].

6. C. Rott, S. In, J. Kumar, and D. Yaylali, "Directional Searches at DUNE for Sub-GeV Monoenergetic Neutrinos Arising from Dark Matter Annihilation in the Sun," JCAP **1701**, no. 01, 016 (2017) [arXiv:1609.04876].

7. C. Rott, S. In, J. Kumar, and D. Yaylali, "Dark Matter Searches for Monoenergetic Neutrinos Arising from Stopped Meson Decay in the Sun," JCAP **1511**, 039 (2015) [arXiv:1510.00170].

8. J. Kumar, D. Marfatia, and D. Yaylali, "Vector dark matter at the LHC," Phys. Rev. D **92**, 095027 (2015) [arXiv:1508.04466].

9. K. R. Dienes, J. Kumar, B. Thomas, and D. Yaylali, "Dark-Matter Decay as a Complementary Probe of Multicomponent Dark Sectors," Phys. Rev. Lett. **114**, 051301 (2015) [arXiv:1406.4868].

10. K. R. Dienes, J. Kumar, B. Thomas, and D. Yaylali, "Overcoming Velocity Suppression in Dark-Matter Direct-Detection," Phys. Rev. D **90**, 015012 (2014) [arXiv:1312.7772].

11. J. Kumar, A. Rajaraman, and D. Yaylali, "Spin Determination for Fermiophobic Bosons," Phys. Rev. D **86**, 115019 (2012) [arXiv:1209.5432].

12. J. Bramante, R.S. Hundi, J. Kumar, A. Rajaraman, and D. Yaylali, "Collider Searches for Fermiophobic Gauge Bosons," Phys. Rev. D **84**, 115018 (2011) [arXiv:1106.3819].

Honors and Awards

June 2018	Air Force Research Lab, Summer Faculty Fellowship Program ◦ Research fellowship awardee — Space Vehicles Directorate
August 2017	Theodore H. Troller Memorial Scholarship
May 2011	Achievement Rewards for College Scientists (ARCS) recipient, Honolulu Chapter ◦ Robert and Doris Pulley Award in Physics

Additional Skills and Hobbies

◦ Basic circuit design and diagnostics, oscilloscopes, and soldering.
◦ Carpentry, electrical, drywall, HVAC, and plumbing
◦ Automotive maintenance and repair; MIG welding
◦ Cycling, surf, ski, snowboard, and SCUBA