

# Stanford

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## Jason Hogan

Associate Professor of Physics

### CONTACT INFORMATION

- **Administrative Contact**

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### Bio

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### ACADEMIC APPOINTMENTS

- Associate Professor, Physics

### LINKS

- Hogan group: <https://hoganlab.stanford.edu/>

### Teaching

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#### COURSES

##### 2025-26

- Electrodynamics: PHYSICS 121 (Spr)
- Electromagnetism: PHYSICS 120 (Win)

##### 2024-25

- Electrodynamics: PHYSICS 121 (Spr)
- Electromagnetism: PHYSICS 120 (Win)

##### 2023-24

- Intermediate Electricity and Magnetism I: PHYSICS 120 (Win)
- Intermediate Electricity and Magnetism II: PHYSICS 121 (Spr)

##### 2022-23

- Intermediate Electricity and Magnetism I: PHYSICS 120 (Win)
- Intermediate Electricity and Magnetism II: PHYSICS 121 (Spr)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Chiara Brandenstein, Sanha Cheong, Jason Corbin, Joseph Curti, Minjeong Kim, Guglielmo Panelli, Michelle Wu, Ocean Zhou

#### Postdoctoral Faculty Sponsor

Yijun Jiang, Yi Lu, Michael Van de Graaff

#### Doctoral Dissertation Advisor (AC)

Mahiro Abe, Rachel Barcklay, Nicholas Entin, Healey Kogan, Aaron Leland, Indra Periwal, Hunter Swan, Dhruv Tandon

#### Doctoral (Program)

Indra Periwal

## Publications

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### PUBLICATIONS

- **Cumulative fidelity of large-momentum-transfer clock atom interferometers in the presence of laser noise** *PHYSICAL REVIEW A*  
Jiang, Y., Rudolph, J., Hogan, J. M.  
2026; 113 (5)
- **A fast, large-scale optimal transport algorithm for holographic beam shaping** *OPTICS EXPRESS*  
Torchylo, A., Swan, H., Tellez, L., Hogan, J. M.  
2026; 34 (4): 6796-6803
- **Terrestrial Very-Long-Baseline Atom Interferometry: summary of the second workshop** *EPJ QUANTUM TECHNOLOGY*  
Abdalla, A., Abe, M., Abend, S., Abidi, M., Aidelsburger, M., Alibabaei, A., Allard, B., Antoniadis, J., Arduini, G., Augst, N., Balamatsias, P., Balaz, A., Banks, et al  
2025; 12 (1)
- **Collinear Three-Photon Excitation of a Strongly Forbidden Optical Clock Transition** *PHYSICAL REVIEW X*  
Carman, S. P., Rudolph, J., Garber, B. E., Van de Graaff, M. J., Swan, H., Jiang, Y., Nantel, M., Abe, M., Barcklay, R. L., Hogan, J. M.  
2025; 15 (3)
- **Search for monopole-dipole interactions with atom interferometry** *PHYSICAL REVIEW D*  
Abe, M., Hogan, J. M., Kaplan, D. E., Overstreet, C., Rajendran, S.  
2025; 111 (11)
- **High-fidelity holographic beam shaping with optimal transport and phase diversity** *OPTICS EXPRESS*  
Swan, H., Torchylo, A., Van De Graaff, M. J., Rudolph, J., Hogan, J. M.  
2025; 33 (3): 6290-6303
- **Terrestrial very-long-baseline atom interferometry: Workshop summary** *AVS QUANTUM SCIENCE*  
Abend, S., Allard, B., Alonso, I., Antoniadis, J., Araujo, H., Arduini, G., Arnold, A. S., Asano, T., Augst, N., Badurina, L., Balaz, A., Banks, H., Barone, et al  
2024; 6 (2)
- **Cold atoms in space: community workshop summary and proposed road-map** *EPJ QUANTUM TECHNOLOGY*  
Alonso, I., Alpigiani, C., Altschul, B., Araujo, H., Arduini, G., Arlt, J., Badurina, L., Balaz, A., Bandarupally, S., Barish, B. C., Barone, M., Barsanti, M., Bass, et al  
2022; 9 (1)
- **Atom Interferometry with Floquet Atom Optics.** *Physical review letters*  
Wilkason, T., Nantel, M., Rudolph, J., Jiang, Y., Garber, B. E., Swan, H., Carman, S. P., Abe, M., Hogan, J. M.  
2022; 129 (18): 183202
- **Matter-wave Atomic Gradiometer Interferometric Sensor (MAGIS-100)** *QUANTUM SCIENCE AND TECHNOLOGY*  
Abe, M., Adamson, P., Borcean, M., Bortoletto, D., Bridges, K., Carman, S. P., Chattopadhyay, S., Coleman, J., Curfman, N. M., DeRose, K., Deshpande, T., Dimopoulos, S., Foot, et al  
2021; 6 (4)
- **AEDGE: Atomic experiment for dark matter and gravity exploration in space** *EXPERIMENTAL ASTRONOMY*  
Bertoldi, A., Bongs, K., Bouyer, P., Buchmueller, O., Canuel, B., Caramete, L., Chiofalo, M., Coleman, J., De Roeck, A., Ellis, J., Graham, P. W., Haehnel, M. G., Hees, et al

2021

- **Ultra-stable Laser System for Next-generation Light-pulse Atom Interferometry** *MAGIS-100*  
Giunta, M., Brekenfeld, M., Bradler, M., Schmidt, D., Fricke, A., Lessing, M., Fischer, M., Thom, J., Hempler, N., Maker, G., Malcolm, G., Kovachy, T., Hogan, et al  
IEEE.2021
- **AEDGE: Atomic Experiment for Dark Matter and Gravity Exploration in Space** *EPJ QUANTUM TECHNOLOGY*  
El-Neaj, Y., Alpigliani, C., Amairi-Pyka, S., Araujo, H., Balaz, A., Bassi, A., Bathe-Peters, L., Battelier, B., Belic, A., Bentine, E., Bernabeu, J., Bertoldi, A., Bingham, et al  
2020; 7 (1)
- **Large Momentum Transfer Clock Atom Interferometry on the 689 nm Intercombination Line of Strontium** *PHYSICAL REVIEW LETTERS*  
Rudolph, J., Wilkason, T., Nantel, M., Swan, H., Holland, C. M., Jiang, Y., Garber, B. E., Carman, S. P., Hogan, J. M.  
2020; 124 (8): 083604
- **SAGE: A proposal for a space atomic gravity explorer** *EUROPEAN PHYSICAL JOURNAL D*  
Tino, G. M., Bassi, A., Bianco, G., Bongs, K., Bouyer, P., Cacciapuoti, L., Capozziello, S., Chen, X., Chiofalo, M. L., Derevianko, A., Ertmer, W., Gaaloul, N., Gill, et al  
2019; 73 (11)
- **Effective Inertial Frame in an Atom Interferometric Test of the Equivalence Principle** *PHYSICAL REVIEW LETTERS*  
Overstreet, C., Asenbaum, P., Kovachy, T., Notermans, R., Hogan, J. M., Kasevich, M. A.  
2018; 120 (18): 183604
- **Search for light scalar dark matter with atomic gravitational wave detectors** *PHYSICAL REVIEW D*  
Arvanitaki, A., Graham, P. W., Hogan, J. M., Rajendran, S., Van Tilburg, K.  
2018; 97 (7)
- **Phase Shift in an Atom Interferometer due to Spacetime Curvature across its Wave Function** *PHYSICAL REVIEW LETTERS*  
Asenbaum, P., Overstreet, C., Kovachy, T., Brown, D. D., Hogan, J. M., Kasevich, M. A.  
2017; 118 (18)
- **Resonant mode for gravitational wave detectors based on atom interferometry** *PHYSICAL REVIEW D*  
Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
2016; 94 (10)
- **Atom-interferometric gravitational-wave detection using heterodyne laser links** *PHYSICAL REVIEW A*  
Hogan, J. M., Kasevich, M. A.  
2016; 94 (3)
- **Kovachy et al. reply.** *Nature*  
Kovachy, T., Asenbaum, P., Overstreet, C., Donnelly, C. A., Dickerson, S. M., Sugarbaker, A., Hogan, J. M., Stamper-Kurn, M. A.  
2016; 537 (7618): E2-3
- **Quantum superposition at the half-metre scale** *NATURE*  
Kovachy, T., Asenbaum, P., Overstreet, C., Donnelly, C. A., Dickerson, S. M., Sugarbaker, A., Hogan, J. M., Kasevich, M. A.  
2015; 528 (7583): 530-?
- **Matter wave lensing to picokelvin temperatures.** *Physical review letters*  
Kovachy, T., Hogan, J. M., Sugarbaker, A., Dickerson, S. M., Donnelly, C. A., Overstreet, C., Kasevich, M. A.  
2015; 114 (14): 143004-?
- **Enhanced Atom Interferometer Readout through the Application of Phase Shear** *PHYSICAL REVIEW LETTERS*  
Sugarbaker, A., Dickerson, S. M., Hogan, J. M., Johnson, D. M., Kasevich, M. A.  
2013; 111 (11)
- **Multiaxis inertial sensing with long-time point source atom interferometry.** *Physical review letters*  
Dickerson, S. M., Hogan, J. M., Sugarbaker, A., Johnson, D. M., Kasevich, M. A.  
2013; 111 (8): 083001-?

- **New method for gravitational wave detection with atomic sensors.** *Physical review letters*  
Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
2013; 110 (17): 171102-?
- **Generation of 43 W of quasi-continuous 780 nm laser light via high-efficiency, single-pass frequency doubling in periodically poled lithium niobate crystals** *OPTICS LETTERS*  
Chiu, S., Kovachy, T., Hogan, J. M., Kasevich, M. A.  
2012; 37 (18): 3861-3863
- **A high-performance magnetic shield with large length-to-diameter ratio** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Dickerson, S., Hogan, J. M., Johnson, D. M., Kovachy, T., Sugarbaker, A., Chiu, S., Kasevich, M. A.  
2012; 83 (6)
- **Reply to "Comment on 'Atomic gravitational wave interferometric sensor'"** *PHYSICAL REVIEW D*  
Dimopoulos, S., Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
2011; 84 (2)
- **An atomic gravitational wave interferometric sensor in low earth orbit (AGIS-LEO)** *GENERAL RELATIVITY AND GRAVITATION*  
Hogan, J. M., Johnson, D. M., Dickerson, S., Kovachy, T., Sugarbaker, A., Chiu, S., Graham, P. W., Kasevich, M. A., Saif, B., Rajendran, S., Bouyer, P., Seery, B. D., Feinberg, et al  
2011; 43 (7): 1953-2009
- **Precision angle sensor using an optical lever inside a Sagnac interferometer** *OPTICS LETTERS*  
Hogan, J. M., Hammer, J., Chiu, S., Dickerson, S., Johnson, D. M., Kovachy, T., Sugarbaker, A., Kasevich, M. A.  
2011; 36 (9): 1698-1700
- **Picosecond Optical Switching Using RF Nonlinear Transmission Lines** *JOURNAL OF LIGHTWAVE TECHNOLOGY*  
Johnson, D. M., Hogan, J. M., Chiu, S., Kasevich, M. A.  
2011; 29 (5): 666-669
- **Optical lattices as waveguides and beam splitters for atom interferometry: An analytical treatment and proposal of applications** *PHYSICAL REVIEW A*  
Kovachy, T., Hogan, J. M., Johnson, D. M., Kasevich, M. A.  
2010; 82 (1)
- **Broadband optical serrodyne frequency shifting** *OPTICS LETTERS*  
Johnson, D. M., Hogan, J. M., Chiu, S., Kasevich, M. A.  
2010; 35 (5): 745-747
- **Gravitational wave detection with atom interferometry** *PHYSICS LETTERS B*  
Dimopoulos, S., Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
2009; 678 (1): 37-40
- **Atomic gravitational wave interferometric sensor** *PHYSICAL REVIEW D*  
Dimopoulos, S., Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
2008; 78 (12)
- **General relativistic effects in atom interferometry** *PHYSICAL REVIEW D*  
Dimopoulos, S., Graham, P. W., Hogan, J. M., Kasevich, M. A.  
2008; 78 (4)
- **How to test atom and neutron neutrality with atom interferometry** *PHYSICAL REVIEW LETTERS*  
Arvanitaki, A., Dimopoulos, S., Geraci, A. A., Hogan, J., Kasevich, M.  
2008; 100 (12)
- **Testing general relativity with atom interferometry** *PHYSICAL REVIEW LETTERS*  
Dimopoulos, S., Graham, P. W., Hogan, J. M., Kasevich, M. A.  
2007; 98 (11)