



## Mark Kasevich

William R. Kenan Jr. Professor, Professor of Physics and of Applied Physics

### CONTACT INFORMATION

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### Bio

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#### ACADEMIC APPOINTMENTS

- Professor, Physics
- Professor, Applied Physics
- Member, Bio-X

#### HONORS AND AWARDS

- Member, National Academy of Sciences

### Teaching

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#### COURSES

##### 2025-26

- Electricity and Magnetism: PHYSICS 43 (Win)

##### 2024-25

- Quantum and Thermal Physics: PHYSICS 71 (Win)

##### 2023-24

- Electricity and Magnetism: PHYSICS 43 (Spr)

##### 2022-23

- Electricity and Magnetism: PHYSICS 43 (Spr)

#### STANFORD ADVISEES

##### Doctoral Dissertation Reader (AC)

Mahiro Abe, Nahal Bagheri, Benjamin Frey, Neomi Lewis, Ocean Zhou

##### Postdoctoral Faculty Sponsor

Shaun Burd, Prashant Kumar

##### Doctoral Dissertation Advisor (AC)

Joseph Curti, Minjeong Kim, Rose Knight, Guglielmo Panelli, Adelaide Pollard, Rudolf Popper, Erik Porter, Joshua Reynolds, Jerry Yen

#### Postdoctoral Research Mentor

Shaun Burd

#### Doctoral (Program)

Abhishek Karve, Enrico Piperno

## Publications

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### PUBLICATIONS

- **Matter waves and clocks do not observe uniform gravitational fields** *PHYSICA SCRIPTA*  
Asenbaum, P., Overstreet, C., Kasevich, M. A.  
2024; 99 (4)
- **Inference of gravitational field superposition from quantum measurements** *PHYSICAL REVIEW D*  
Overstreet, C., Curti, J., Kim, M., Asenbaum, P., Kasevich, M. A., Giacomini, F.  
2023; 108 (8)
- **Multi-pass Imaging Flow Cytometry.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*  
Reynolds, J. L., Israel, Y., Kasevich, M. A.  
2023; 29 (Supplement\_1): 1064-1065
- **Wide-field fluorescence lifetime imaging of neuron spiking and subthreshold activity in vivo.** *Science (New York, N.Y.)*  
Bowman, A. J., Huang, C., Schnitzer, M. J., Kasevich, M. A.  
2023; 380 (6651): 1270-1275
- **Continuous wave multi-pass imaging flow cytometry** *OPTICA*  
Israel, Y., Reynolds, J. L., Klopfer, B. B., Kasevich, M. A.  
2023; 10 (4): 491-496
- **Robust Optimized Pulse Schemes for Atomic Fountain Interferometry** *ATOMS*  
Goerz, M. H., Kasevich, M. A., Malinovsky, V. S.  
2023; 11 (2)
- **Nanosecond Photoemission near the Potential Barrier of a Schottky Emitter** *PHYSICAL REVIEW APPLIED*  
Reynolds, J. L., Israel, Y., Bowman, A. J., Klopfer, B. B., Kasevich, M. A.  
2023; 19 (1)
- **Distributed quantum sensing with mode-entangled spin-squeezed atomic states.** *Nature*  
Malia, B. K., Wu, Y., Martinez-Rincon, J., Kasevich, M. A.  
2022
- **Utilizing machine learning to improve the precision of fluorescence imaging of cavity-generated spin squeezed states** *PHYSICAL REVIEW A*  
Malia, B. K., Wu, Y., Martinez-Rincon, J., Kasevich, M. A.  
2022; 105 (1)
- **Observation of a gravitational Aharonov-Bohm effect.** *Science (New York, N.Y.)*  
Overstreet, C., Asenbaum, P., Curti, J., Kim, M., Kasevich, M. A.  
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- **Matter-wave Atomic Gradiometer Interferometric Sensor (MAGIS-100)** *QUANTUM SCIENCE AND TECHNOLOGY*  
Abe, M., Adamson, P., Borceean, 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)

- **Resonant Electro-Optic Imaging for Microscopy at Nanosecond Resolution.** *ACS nano*  
Bowman, A. J., Kasevich, M. A.  
2021
- **Information transfer as a framework for optimized phase imaging** *OPTICA*  
Koppell, S., Kasevich, M.  
2021; 8 (4): 493-501
- **Fast pulse shaping for a novel gated electron mirror** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Klopper, B. B., Koppell, S. A., Bowman, A. J., Israel, Y., Kasevich, M. A.  
2021; 92 (4)
- **Fast pulse shaping for a novel gated electron mirror.** *The Review of scientific instruments*  
Klopper, B. B., Koppell, S. A., Bowman, A. J., Israel, Y., Kasevich, M. A.  
2021; 92 (4): 043705
- **Physically significant phase shifts in matter-wave interferometry** *AMERICAN JOURNAL OF PHYSICS*  
Overstreet, C., Asenbaum, P., Kasevich, M. A.  
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- **40 W, 780 nm laser system with compensated dual beam splitters for atom interferometry** *OPTICS LETTERS*  
Kim, M., Notermans, R., Overstreet, C., Curti, J., Asenbaum, P., Kasevich, M. A.  
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- **High-extinction electron pulses by laser-triggered emission from a Schottky emitter** *APPLIED PHYSICS LETTERS*  
Israel, Y., Bowman, A. J., Klopper, B. B., Koppell, S. A., Kasevich, M. A.  
2020; 117 (19)
- **Retrieval of cavity-generated atomic spin squeezing after free-space release** *PHYSICAL REVIEW A*  
Wu, Y., Krishnakumar, R., Martínez-Rincon, J., Malia, B. K., Hosten, O., Kasevich, M. A.  
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- **Free Space Ramsey Spectroscopy in Rubidium with Noise below the Quantum Projection Limit** *PHYSICAL REVIEW LETTERS*  
Malia, B. K., Martínez-Rincon, J., Wu, Y., Hosten, O., Kasevich, M. A.  
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- **Free Space Ramsey Spectroscopy in Rubidium with Noise below the Quantum Projection Limit.** *Physical review letters*  
Malia, B. K., Martínez-Rincón, J., Wu, Y., Hosten, O., Kasevich, M. A.  
2020; 125 (4): 043202
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El-Neaj, Y., Alpigiani, 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  
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- **Atom-Interferometric Test of the Equivalence Principle at the  $10^{-12}$  Level.** *Physical review letters*  
Asenbaum, P. n., Overstreet, C. n., Kim, M. n., Curti, J. n., Kasevich, M. A.  
2020; 125 (19): 191101
- **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)
- **Design for a 10keV multi-pass transmission electron microscope.** *Ultramicroscopy*  
Koppell, S. A., Mankos, M., Bowman, A. J., Israel, Y., Juffmann, T., Klopper, B. B., Kasevich, M. A.  
2019; 207: 112834
- **Electro-optic imaging enables efficient wide-field fluorescence lifetime microscopy.** *Nature communications*  
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- **Full-field cavity enhanced microscopy techniques** *JOURNAL OF PHYSICS-PHOTONICS*  
Nimmrichter, S., Chen, C., Klopfer, B. B., Kasevich, M. A., Juffmann, T.  
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- **Effective Inertial Frame in an Atom Interferometric Test of the Equivalence Principle** *PHYSICAL REVIEW LETTERS*  
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- **Atom-interferometric gravitational-wave detection using heterodyne laser links** *PHYSICAL REVIEW A*  
Hogan, J. M., Kasevich, M. A.  
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- **Multi-pass microscopy** *NATURE COMMUNICATIONS*  
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- **Single-shot simulations of dynamic quantum many-body systems** *NATURE PHYSICS*  
Sakmann, K., Kasevich, M.  
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- **Measurement noise 100 times lower than the quantum-projection limit using entangled atoms** *NATURE*  
Hosten, O., Engelsen, N. J., Krishnakumar, R., Kasevich, M. A.  
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- **Measurement noise 100 times lower than the quantum-projection limit using entangled atoms.** *Nature*  
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- **Engineering Spin-Squeezed States for Quantum-Enhanced Atom Interferometry**  
Engelsen, N. J., Hosten, O., Krishnakumar, R., Kasevich, M. A., IEEE  
IEEE.2016
- **Ultrafast Time-Resolved Photoelectric Emission** *PHYSICAL REVIEW LETTERS*  
Juffmann, T., Klopfer, B. B., Skulason, G. E., Kealhofer, C., Xiao, F., Foreman, S. M., Kasevich, M. A.  
2015; 115 (26)
- **Ultrafast Time-Resolved Photoelectric Emission.** *Physical review letters*  
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- **Matter wave lensing to picokelvin temperatures.** *Physical review letters*  
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- **Matter Wave Lensing to Picokelvin Temperatures** *PHYSICAL REVIEW LETTERS*  
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2015; 91 (3)
- **Ultrafast oscilloscope based on laser-triggered field emitters** *OPTICS LETTERS*  
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- **Ground-state fragmentation phase transition for attractive bosons in anisotropic traps** *PHYSICAL REVIEW A*  
Cizek, N. C., Kasevich, M. A.  
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- **Zero-Dead-Time Operation of Interleaved Atomic Clocks** *PHYSICAL REVIEW LETTERS*  
Biedermann, G. W., Takase, K., Wu, X., Deslauriers, L., Roy, S., Kasevich, M. A.  
2013; 111 (17)
- **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.

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- **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)
- **Multi-axis 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.  
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- **Multi-axis Inertial Sensing with Long-Time Point Source Atom Interferometry** *PHYSICAL REVIEW LETTERS*  
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- **New method for gravitational wave detection with atomic sensors.** *Physical review letters*  
Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
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- **New method for gravitational wave detection with atomic sensors.** *Physical review letters*  
Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
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- **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*  
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- **Ultrafast laser-triggered emission from hafnium carbide tips** *PHYSICAL REVIEW B*  
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- **A high-performance magnetic shield with large length-to-diameter ratio** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
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- **Absolute Geodetic Rotation Measurement Using Atom Interferometry** *PHYSICAL REVIEW LETTERS*  
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- **102(h)over-bark Large Area Atom Interferometers** *PHYSICAL REVIEW LETTERS*  
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- **Raman Lasing with a Cold Atom Gain Medium in a High-Finesse Optical Cavity** *PHYSICAL REVIEW LETTERS*  
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- **Reply to "Comment on 'Atomic gravitational wave interferometric sensor'"** *PHYSICAL REVIEW D*  
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- **An atomic gravitational wave interferometric sensor in low earth orbit (AGIS-LEO)** *GENERAL RELATIVITY AND GRAVITATION*  
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- **Precision angle sensor using an optical lever inside a Sagnac interferometer** *OPTICS LETTERS*  
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- **Broadband optical serrodyne frequency shifting** *OPTICS LETTERS*  
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- **Atom Interferometric Navigation Sensors** *2010 IEEE Sensors Conference*  
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- **Gravitational wave detection with atom interferometry** *PHYSICS LETTERS B*  
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- **Atomic gravitational wave interferometric sensor** *PHYSICAL REVIEW D*

- Dimopoulos, S., Graham, P. W., Hogan, J. M., Kasevich, M. A., Rajendran, S.  
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- **Backaction noise produced via cavity-aided nondemolition measurement of an atomic clock state** *PHYSICAL REVIEW A*  
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  - **General relativistic effects in atom interferometry** *PHYSICAL REVIEW D*  
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  - **How to test atom and neutron neutrality with atom interferometry** *PHYSICAL REVIEW LETTERS*  
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  - **Space-based research in fundamental physics and quantum technologies** *International Workshop From Quantum to Cosmos - Fundamental Physics Research in Space*  
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