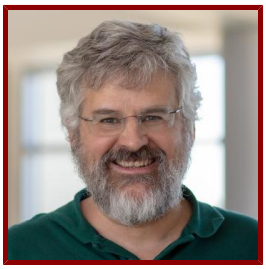
Stanford



Kent Irwin

Professor of Physics, of Particle Physics and Astrophysics and of Photon Science

CONTACT INFORMATION

- **Administrative Contact**

  Dana Volponi

  Email danav@stanford.edu

Bio

BIO

Irwin Group web page:

https://irwinlab.stanford.edu/

ACADEMIC APPOINTMENTS

- Professor, Physics
- Professor, Particle Physics and Astrophysics
- Professor, Photon Science Directorate

ADMINISTRATIVE APPOINTMENTS

- Faculty Director, Hansen Experimental Physics Laboratory, (2020- present)
- Professor of Physics and of Particle Physics and Astrophysics and Photon Science, Stanford and SLAC, (2013- present)
- Fellow, National Institute of Standards and Technology (NIST), (2007-2013)
- Professor Adjoint, Astrophysics and Planetary Sciences, University of Colorado, (2006-2013)
- Supervisory Physicist, National Institute of Standards and Technology (NIST), (2002-2007)
- Physicist, National Institute of Standards and Technology (NIST), (1996-2002)
- Postdoctoral Researcher, National Institute of Standards and Technology (NIST), (1995-1996)

HONORS AND AWARDS

- Department of Commerce Gold Medal, United States Department of Commerce (DOC) (2012)
- Fellow, American Physical Society (2007)
- Joseph F. Keithley Award, American Physical Society (2007)
- Arthur S. Flemming Award, George Washington University (2006)

PROFESSIONAL EDUCATION

- Ph.D., Stanford University (1995)
- M.S., Stanford University (1995)

- B.S., California Institute of Technology (1988)

LINKS

- Irwin Group: https://irwinlab.stanford.edu/

Teaching

COURSES

2026-27

- Modern Physics: PHYSICS 25 (Spr)

2025-26

- Modern Physics: PHYSICS 25 (Spr)

2024-25

- Modern Physics: PHYSICS 25 (Spr)

2023-24

- Modern Physics: PHYSICS 25 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Taj Dyson, Yuka Nakato

Postdoctoral Faculty Sponsor

Alexander Droster, Aya Keller

Doctoral Dissertation Advisor (AC)

Tori Ankel, Christina Bell, Jason Corbin, Ameya Kunder, Meghan Marangola, Jyotirmai Singh, Pamela Stark, Barkotel Zemenu, Cady van Assendelft

Publications

PUBLICATIONS

- **Design and Performance of 220 and 270 GHz Bandpass Filters for BICEP Array** *IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY*
  Steiger, A., Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Bischoff, C. A., Beck, D., Bock, J. J., Boenish, H., Buza, V., Carter, K., Cheshire, et al
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  Kornoelje, K., Bleem, L. E., Rykoff, E. S., Abbott, T. C., Ade, P. R., Aguena, M., Alves, O., Anderson, A. J., Oliveira, F., Ansarinejad, B., Archipley, M., Ashby, M. N., Austermann, et al
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- **Magic Diamond: Covalent Bond Formation of Melamine and Other Amines on Nanodiamond Surfaces.** *ACS omega*
  Cheung, T. C., Stokes, C. X., Lopez-Rosas, J. A., Drew, G. O., Drew, J. L., Lakshmi, A., Susendran, N., Qasim, M., Melendrez, C., Lee, S. J., Green, A., Lu, J., Altoe, et al
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- **Measurement of the Full Shape of the Thermal Sunyaev-Zel'dovich Power Spectrum from the South Pole Telescope and Herschel-SPIRE Observations** *ASTROPHYSICAL JOURNAL LETTERS*
  Raghunathan, S., Ade, P. R., Anbajagane, D., Anderson, A. J., Ansarinejad, B., Archipley, M., Austermann, J. E., Balkenhol, L., Barron, D. R., Barry, P. S., Beall, J. A., Benabed, K., Bender, et al
  2026; 1002 (1)

- **Magic Diamond: Covalent Bond Formation of Melamine and Other Amines on Nanodiamond Surfaces** *ACS OMEGA*
  Cheung, T., Stokes, C. X., Lopez-Rosas, J. A., Drew, G., Drew, J., Lakshmi, A., Susendran, N., Qasim, M., Melendrez, C., Lee, S., Green, A., Lu, J., Altoe, et al
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- **The Simons Observatory: forecasted constraints on primordial gravitational waves with the expanded array of Small Aperture Telescopes** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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- **BICEP/Keck. XIX. Extremely Thin Composite Polymer Vacuum Windows for BICEP and Other High-throughput Millimeter-wave Telescopes** *ASTROPHYSICAL JOURNAL*
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- **BICEP/Keck. XX. Component-separated Maps of the Polarized Cosmic Microwave Background and Thermal Dust Emission Using Planck and BICEP/Keck Observations through the 2018 Observing Season** *ASTROPHYSICAL JOURNAL*
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- **The Atacama Cosmology Telescope: DR6 constraints on extended cosmological models** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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- **The Atacama Cosmology Telescope: DR6 maps** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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- **The Atacama Cosmology Telescope: DR6 power spectra, likelihoods and ΛCDM parameters** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*
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- **Electromagnetic modeling and science reach of DMRadio-m3** *PHYSICAL REVIEW D*

Alshirawi, A., Ankel, V., Bartram, C., Begin, J., Bell, C., Benabou, J. N., Brouwer, L., Chaudhuri, S., Cho, H., Corbin, J., Craddock, W., Cuadra, S., Droster, et al

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- **The Simons Observatory: science goals and forecasts for the enhanced Large Aperture Telescope** *JOURNAL OF COSMOLOGY AND ASTROPARTICLE PHYSICS*

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- **The X-ray Integral Field Unit at the end of the Athena reformulation phase** *EXPERIMENTAL ASTRONOMY*

  Peille, P., Barret, D., Cucchetti, E., Albouys, V., Piro, L., Simionescu, A., Cappi, M., Bellouard, E., Cenac-Morthe, C., Daniel, C., Pradines, A., Finoguenov, A., Kelley, et al

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- **BICEP/Keck XVIII: Measurement of BICEP3 polarization angles and consequences for constraining cosmic birefringence and inflation** *PHYSICAL REVIEW D*

  Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Bischoff, C. A., Beck, D., Bock, J. J., Boenish, H., Buza, V., Cheshire, J. R., Connors, J., Cornelison, et al

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- **Analysis of Polarized Dust Emission Using Data from the First Flight of SPIDER** *ASTROPHYSICAL JOURNAL*

  Ade, P. R., Amiri, M., Benton, S. J., Bergman, A. S., Bihary, R., Bock, J. J., Bond, J. R., Bonetti, J. A., Bryan, S. A., Chiang, H. C., Contaldi, C. R., Dore, O., Duivenvoorden, et al

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- **SPT clusters with DES and HST weak lensing. II. Cosmological constraints from the abundance of massive halos** *PHYSICAL REVIEW D*

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- **In-flight performance of Spider's 280-GHz receivers** *JOURNAL OF ASTRONOMICAL TELESCOPES INSTRUMENTS AND SYSTEMS*

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  Raghunathan, S., Ade, P. A., Anderson, A. J., Ansarinejad, B., Archipley, M., Austermann, J. E., Balkenhol, L., Beall, J. A., Benabed, K., Bender, A. N., Benson, B. A., Bianchini, F., Bleem, et al

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- **Results and Limits of Time-Division Multiplexing for the BICEP Array High-Frequency Receivers** *JOURNAL OF LOW TEMPERATURE PHYSICS*

Fatigoni, S., Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Bischoff, C. A., Beck, D., Bock, J. J., Buza, V., Cheshire, J., Connors, J., Cornelison, et al

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- **End-to-End Modeling of the TDM Readout System for CMB-S4** *JOURNAL OF LOW TEMPERATURE PHYSICS*

  Goldfinger, D. C., Ahmed, Z., Barron, D. R., Doriese, W. B., Durkin, M., Filippini, J. P., Haller, G., Henderson, S. W., Herbst, R., Hubmayr, J., Irwin, K., Reese, B., Sapozhnikov, et al

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- **Atacama Cosmology Telescope: High-resolution component-separated maps across one third of the sky** *PHYSICAL REVIEW D*

  Coulton, W., Madhavacheril, M. S., Duivenvoorden, A. J., Hill, J., Abril-Cabezas, I., Ade, P. A. R., Aiola, S., Alford, T., Amiri, M., Amodeo, S., An, R., Atkins, Z., Austermann, et al

  2024; 109 (6)

- **The Atacama Cosmology Telescope: A Measurement of the DR6 CMB Lensing Power Spectrum and Its Implications for Structure Growth** *ASTROPHYSICAL JOURNAL*

  Qu, F., Sherwin, B. D., Madhavacheril, M. S., Han, D., Crowley, K. T., Abril-Cabezas, I., Ade, P. A. R., Aiola, S., Alford, T., Amiri, M., Amodeo, S., An, R., Atkins, et al

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- **The Atacama Cosmology Telescope: DR6 Gravitational Lensing Map and Cosmological Parameters** *ASTROPHYSICAL JOURNAL*

  Madhavacheril, M. S., Qu, F. J., Sherwin, B. D., Maccrann, N., Li, Y., Abril-Cabezas, I., Ade, P. A. R., Aiola, S., Alford, T., Amiri, M., Amodeo, S., An, R., Atkins, et al

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- **In-Flight Performance of SPIDER's 280 GHz Receivers**

  Shaw, E. C., Ade, P. R., Akers, S., Amiri, M., Austermann, J., Beall, J., Becker, D. T., Benton, S. J., Bergman, A. S., Bock, J. J., Bond, J. R., Bryan, S. A., Chiang, et al

  edited by Zmuidzinas, J., Gao

  SPIE-INT SOC OPTICAL ENGINEERING.2024

- **Quantum Diamonds at the Beach: Chemical Insights into Silica Growth on Nanoscale Diamond using Multimodal Characterization and Simulation.** *ACS nanoscience Au*

  Sandoval, P. J., Lopez, K., Arreola, A., Len, A., Basravi, N., Yamaguchi, P., Kawamura, R., Stokes, C. X., Melendrez, C., Simpson, D., Lee, S. J., Titus, C. J., Altoe, et al

  2023; 3 (6): 462-474

- **Measurement of gravitational lensing of the cosmic microwave background using SPT-3G 2018 data** *PHYSICAL REVIEW D*

  Pan, Z., Bianchini, F., Wu, W. K., Ade, P. R., Ahmed, Z., Anderes, E., Anderson, A. J., Ansarinejad, B., Archipley, M., Aylor, K., Balkenhol, L., Barry, P. S., Thakur, et al

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- **BICEP Array: 150 GHz Detector Module Development** *JOURNAL OF LOW TEMPERATURE PHYSICS*

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- **Quantum Diamonds at the Beach: Chemical Insights into Silica Growth on Nanoscale Diamond using Multimodal Characterization and Simulation** *ACS NANOSCIENCE AU*

  Sandoval, P. J., Lopez, K., Arreola, A., Len, A., Basravi, N., Yamaguchi, P., Kawamura, R., Stokes, C. X., Melendrez, C., Simpson, D., Lee, S., Titus, C., Altoe, et al

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- **Measurements of DC SQUID Damping Effects on Superconducting Resonant Circuits** *IEEE TRANSACTIONS ON APPLIED SUPERCONDUCTIVITY*

  van Assendelft, E. C., Cho, H., Corbin, J., Kuenstner, S., Li, D., Phipps, A., Rapidis, N. M., Singh, J., Wells, K., Irwin, K. D.

  2023; 33 (5)

- **BICEP/Keck. XVII. Line-of-sight Distortion Analysis: Estimates of Gravitational Lensing, Anisotropic Cosmic Birefringence, Patchy Reionization, and Systematic Errors** *ASTROPHYSICAL JOURNAL*

  Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Bischoff, C. A., Beck, D., Bock, J. J., Boenish, H., Bullock, E., Buza, V., Cheshire, J. R., Connors, et al

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- **Plastic Laminate Antireflective Coatings for Millimeter-Wave Optics in BICEP Array** *JOURNAL OF LOW TEMPERATURE PHYSICS*
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- **BICEP/Keck. XVI. Characterizing Dust Polarization through Correlations with Neutral Hydrogen** *ASTROPHYSICAL JOURNAL*
  Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Bischoff, C. A., Beck, D., Bock, J. J., Boenish, H., Bullock, E., Buza, V., Cheshire, J. R., Clark, et al
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- **Simultaneous Millimeter-wave, Gamma-Ray, and Optical Monitoring of the Blazar PKS 2326-502 during a Flaring State** *ASTROPHYSICAL JOURNAL LETTERS*
  Hood II, J. C., Simpson, A., McDaniel, A., Foster, A., Ade, P. R., Ajello, M., Anderson, A. J., Austermann, J. E., Beall, J. A., Bender, A. N., Benson, B. A., Bianchini, F., Bleem, et al
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  Barret, D., Albouys, V., den Herder, J., Piro, L., Cappi, M., Huovelin, J., Kelley, R., Miguel Mas-Hesse, J., Paltani, S., Rauw, G., Rozanska, A., Svoboda, J., Wilms, et al
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- **Asteroid Measurements at Millimeter Wavelengths with the South Pole Telescope** *ASTROPHYSICAL JOURNAL*
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  2022; 936 (2)
- **In-Flight Gain Monitoring of SPIDER's Transition-Edge Sensor Arrays** *JOURNAL OF LOW TEMPERATURE PHYSICS*
  Filippini, J. P., Gambrel, A. E., Rahlin, A. S., Young, E. Y., Ade, P. R., Amiri, M., Benton, S. J., Bergman, A. S., Bihary, R., Bock, J. J., Bond, J. R., Bonetti, J. A., Bryan, et al
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- **A Simulation-based Method for Correcting Mode Coupling in CMB Angular Power Spectra** *ASTROPHYSICAL JOURNAL*
  Leung, J., Hartley, J., Nagy, J. M., Netterfield, C. B., Shariff, J. A., Ade, P. R., Amiri, M., Benton, S. J., Bergman, A. S., Bihary, R., Bock, J. J., Bond, J. R., Bonetti, et al
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- **A Constraint on Primordial B-modes from the First Flight of the Spider Balloon-borne Telescope** *ASTROPHYSICAL JOURNAL*
  Ade, P. R., Amiri, M., Benton, S. J., Bergman, A. S., Bihary, R., Bock, J. J., Bond, J. R., Bonetti, J. A., Bryan, S. A., Chiang, H. C., Contaldi, C. R., Dore, O., Duivenvoorden, et al
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- **BICEP/Keck XV: The BICEP3 Cosmic Microwave Background Polarimeter and the First Three-year Data Set** *ASTROPHYSICAL JOURNAL*

Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Bischoff, C. A., Beck, D., Bock, J. J., Boenish, H., Bullock, E., Buza, Cheshire, J. R., Connors, J., et al

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- **The Design and Integrated Performance of SPT-3G** *ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES*

  Sobrin, J. A., Anderson, A. J., Bender, A. N., Benson, B. A., Dutcher, D., Foster, A., Goeckner-Wald, N., Montgomery, J., Nadolski, A., Rahlin, A., Ade, P. R., Ahmed, Z., Anderes, et al

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- **BICEP/Keck XIV: Improved constraints on axionlike polarization oscillations in the cosmic microwave background** *PHYSICAL REVIEW D*

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- **Metastable Brominated Nanodiamond Surface Enables Room Temperature and Catalysis-Free Amine Chemistry.** *The journal of physical chemistry letters*

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  Cornelison, J., Verges, C., Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Beck, D., Bischoff, C. A., Bock, J. J., Buza, Cheshire, J. R., Connors, J., et al

  edited by Zmuidzinas, J., Gao

  SPIE-INT SOC OPTICAL ENGINEERING.2022

- **2022 Upgrade and Improved Low Frequency Camera Sensitivity for CMB Observation at the South Pole**

  Soliman, A., Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Bischoff, C. A., Beck, D., Bock, J. J., Buza, Cheshire, J., Connors, J., Cornelison, J., et al

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- **Thermal Testing for Cryogenic CMB Instrument Optical Design**

  Goldfinger, D. C., Ade, P. R., Ahmed, Z., Amiri, M., Barkats, D., Thakur, R., Beck, D., Bischoff, C. A., Bock, J. J., Buza, Cheshire, J., Connors, J., Cornelison, J., et al

  edited by Zmuidzinas, J., Gao

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