

## David A. Stricker

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### Profile

R&D Engineer with 11 years experience bringing high technology projects of up to \$2 million to fruition. Worked on low temperature space based physics programs. Reputation for making projects successful despite ambiguity, resource constraints, and various management challenges.

- Vacuum Systems and Leak Detection
- Cleanroom Experience with Si Etching
- Cryogenic and High Temp. Experience
- Low Temp. Thermal Conductivity Testing
- Materials Processed: Cu, Si, Nb, Al, Ti, Pb, Pt, In, Sn, Fused Quartz, Macor

### Highlights

- Successfully led Differential Accelerometer project, improving team productivity in “a very challenging management environment.” Inner accelerometer parts met dimensional specs and electrical contact tests, and are awaiting assembly tests.
- Assisted in perfecting surface finishing on anisotropically etched silicon microstructures. This process is used in MEMS devices such as MicroMirrors, Accelerometers, and Pressure Sensors.
- Experience with design and fabrication of thin film superconducting devices by thermal evaporation and sputtering in a high vacuum system.
- Working with electrical and mechanical engineers and low temperature scientists, assembled inner accelerometer prototype to test electrostatic positioning system. Acquired and applied basic mechanical engineering knowledge “on the fly” to create and establish appropriate tests and specifications.

## Experience

### **2009-Present** Administrative Assistant, KIPAC, Stanford University, CA

Use of Oracle Financials to do reimbursements for KIPAC faculty members, their post docs and graduate students. Experience with Oracle procurement procedures and regulations such as PTA's, fabrication accounts, and expenditure codes. Experience with keeping calendars for faculty using Google calendar and Stanford's calendar system. Experience with Fed Ex. and UPS in both Hansen Labs and Varian Physics shipping and receiving. Basically, getting done what needs to be done for world class science to continue at Stanford Univ.

### **2008** Research Administrator (Temp Position), Ginzton Laboratory, Stanford University, CA

Six months assisting Research Administrator writing budgets and processing paperwork for proposals for grants and contracts for Ginzton Faculty. Use of various websites: NSF (Fast lane), DARPA, Grants.gov, NASA. Worked with the Dean of Research and Office of Sponsored Research on Stanford campus.

### **1996 - 2007** R&D Engineer, Hansen Experimental Physics Lab, Stanford University, CA

2005-2007 Satellite Test of the Equivalence Principle (STEP) Principle Investigator  
Prof. Francis Everitt

Responsible Engineer coordinating the Differential Accelerometer Hardware Group. Successfully led and completed \$280K quartz accelerometer parts procurement and assembly project.

- As member of scientific team, successfully assembled high precision quartz instrument components involving 2 micron clearances from Axsys Technologies meeting flight specifications (currently awaiting further low temperature assembly tests).
- Assisted team with addition of superconducting circuitry and Au coatings.
- Worked with Stanford Procurement and building manager to satisfy federal guidelines and property inventory protocols for Stanford fabrications. Used Oracle Financial software for purchases.
- Ran weekly meetings with scientists, mechanical and manufacturing engineers on fabrication drawings, tolerance accumulation analysis, and material properties.

2000-2005 Superconducting Microwave Oscillators (SUMO) Principle Investigator Prof. John Lipa

Responsible for procurement and fabrication of superconducting microwave oscillators made from high purity niobium. Part of scientific team that tested and modeled materials.

- Fabricated and assembled oscillators, involved testing acid etches on niobium, use of a nitrogen glove box for assembly with indium o-rings, ion pumps, and leak detector.
- Assisted in testing oscillators which involved operation of cryogenic probes.
- Brazed antenna assemblies using quartz vacuum oven for microwave oscillators.
- Finite element analysis using COSMOS packaged software on Sun Workstations.

2000 Gravity Probe B (GPB) Principle Investigator Prof. Francis Everitt

Maintained the cryogenic gyroscope commissioning probe used to test unique \$1 million flight hardware. This involved 100 liter liquid helium transfers, assembly and disassembly of cryogenic vacuum seals, rebuild of high voltage coax lines, 24 hour monitoring.

- Assisted in the magnetic screening of parts using cryogenic test equipment.

1996-2000 Confined Helium Experiment (CHEX) Principle Investigator Prof. John Lipa

Constructed flight hardware, which flew aboard the Space Shuttle Columbia in 1997. Specifically: researched and constructed high resolution paramagnetic salt crystal thermometers with high thermal conductivity, aided in the fabrication and development of silicon wafers at Northeastern Univ., MA which were used to confine the liquid helium. This involved clean room techniques such as photolithography and etching. Coordinated the delivery of the wafers among Northeastern University, Jet Propulsion Labs, and Stanford Univ.

- Wrote and tested software to monitor the high resolution thermometers before, during, and after the flight mission.

- Technology transfer for flight hardware development, assembly, and monitoring. This included travel as needed to Jet Propulsion Laboratory, CA; Marshall Space Center, AL; Northeastern Univ., MA.

**1991-1996 Research Assistant**, Hansen Experimental Physics Lab, Stanford University, CA  
Lambda Point Experiment (LPE) Principle Investigator Prof. John Lipa

- Wrote programs in PV WAVE (a numerical analysis and visualization software by Visual Numerics) to monitor real-time data for the Lambda Point Experiment which flew aboard the Space Shuttle Columbia on Oct. 22, 1992.
- Assisted in testing the Lambda Point Experiment prototype.

**1987-1991 Research Assistant**, Department of Physics and Astronomy, San Francisco State University, CA

- Designed and fabricated thin film superconducting devices by thermal evaporation and sputtering in a high vacuum system.
- Tested and characterized Nb, Al, and Sn superconducting tunnel junctions in liquid helium and on a one-shot 0.3 Kelvin probe.
- Coordinated undergraduate and graduate students for projects.

## Education

- 1991 MS Physics**, San Francisco State University, CA  
 Thesis: Fabricated and analyzed current-voltage characteristics of superconducting tunnel junctions for use as particle detectors
- 1988 BS Physics**, magna cum laude, San Francisco State University, CA
- 1987 BA Math**, magna cum laude, San Francisco State University, CA

## Awards and Honors

- 1999** Space Flight Awareness Team Award for significant new insight into the behavior of confined helium and for the project being delivered on time and under budget. Jan. 1999
- 1998** Notable Organizational Value-Added Award presented by Jet Propulsion Laboratory in recognition of the CHeX Team's outstanding support to the Space and Earth Science Programs Directorate. July 10, 1998
- 1998** Group Achievement Award; presented by NASA for the successful flight of the Confined Helium Experiment which met or exceeded each of its science requirements. April, 1998
- 1988** Membership in Phi Beta Kappa
- 1986-1988** Outstanding Academic Achievement Awards

## References

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## Publications/Presentations

1. C. Mehls, D. Stricker, *STEP Differential Accelerometer Status and Testing of Inner DA*, poster presentation at Quantum to Cosmos 2, international workshop, Bremen, Germany, June 2007
2. Carsten Mehls, Dale Gill, Christopher Cox, Neel Vora, David Stricker, Eric Berglund, Paritosh Ambekar, Rodney Torii, and Suwen Wang, *Effect of Surface Roughness on Critical Current of Niobium Films*, AIP Conference Proceedings, LT24, Vol. 850, pp. 991-992 (Sept. 2006)
3. Suwen Wang, D. Avaloff, J.A. Nissen, D.A. Stricker, and J. A. Lipa, *A Continuous  $^4\text{He}$  Refrigerator for use in a Superfluid Helium Bath*, AIP Conference Proceedings, **850** 1565, (2006)
4. J.A. Lipa, J. Nissen, S. Wang, D. Avaloff and D. Stricker, *Cavity Clock Experiments on Space Station*, Adv. Space Research, **35**, 82 (2005)
5. J.A. Nissen, J.A. Lipa, S. Wang, K. Luna, D.A. Stricker, D. Avaloff, *Prospects for Improved Lorentz Violation Measurements using Cryogenic Resonators*, Proc. Third Meeting on CPT and Lorentz Symmetry, V.A. Kostelecky, ed., World Scientific, Singapore, 193, (2004)
6. J.A. Lipa, J.A. Nissen, S. Wang, D.A. Stricker, and D. Avaloff, *New Limit on Signals of Lorentz Violation in Electrodynamics*, Phys. Rev. Lett. **90**, 060403 (2003)
7. J.A. Lipa, J.A. Nissen, D.A. Stricker, and D.R. Swanson, T.C.P. Chui, *Specific heat of liquid helium in zero gravity very near the lambda point*, Phys. Rev. B, **68**, 174518 (2003)
8. J.A. Lipa, J.A. Nissen, S. Wang, D.A. Stricker and D. Avaloff, *Testing Relativity with Clocks on Space Station*, Proc. 6th Symposium on Frequency Standards and Metrology (St Andrews, Scotland, 9/01), ed: P. Gill, World Scientific, 2002, p.615.
9. J.A. Nissen, S. Wang, D. Avaloff, D.A. Stricker and J.A. Lipa, *Testing Relativity with Clocks on Space Station*, Proc. CPT and Lorentz Symmetry Conf. (Bloomington, Indiana, 8/01) ed: V.A. Kostelecky, World Scientific, 2002, p.181.

10. J.A. Nissen, J.A. Lipa , S. Wang, D. Avaloff, D.A. Stricker, S. Buchman and Y.C. Lin, *Progress in Developing a Superconducting Microwave Oscillator for Precision Measurements on Orbit*, Proc 2002 NASA/JPL Fundamental Physics in Space Workshop (Dana Point, May, 2002).
11. J.A. Lipa, D.A. Stricker, D. Avaloff and S. Wang, *Compressibility Measurements near the Critical Point of Oxygen*, Proc 2002 NASA/JPL Fundamental Physics in Space Workshop (Dana Point, May, 2002).
12. J.A. Nissen, J.A. Lipa, S. Wang, D. Avaloff, D.A. Stricker and S. Buchman, *Testing Relativity with Clocks on Space Station*, Proc. 2<sup>nd</sup> Pan Pacific Workshop on Microgravity Sciences, Pasadena, FP-1033, (2001)
13. J.A. Lipa, D. Avaloff, S. Wang and D.A. Stricker, *Low Gravity Simulator for Critical Point Studies with Oxygen*, 2nd Pan Pacific Workshop on Microgravity Sciences, Pasadena, 5/01.
14. J. A. Lipa, D. R. Swanson, J. A. Nissen, Z. K. Geng, P. R. Williamson, D. A. Stricker, T. C. P. Chui, U. E. Israelsson, and M. Larson, *Specific Heat of Helium Confined to a 57- $\mu$ m Planar Geometry near the Lambda Point*, Phys. Rev. Lett. **84**, 4894 (2000)
15. J.A. Nissen, D.R. Swanson, D.A. Stricker and J.A. Lipa, *Vibration Effects in Low Temperature Condensed Matter Experiments in Space*, AIAA-2000-0943, American Institute of Aeronautics and Astronautics, 1, (2000)
16. J.A. Lipa, D.R. Swanson, J.A. Nissen, P.R. Williamson, K. Geng and D.A. Stricker, *Preliminary Results from the Confined Helium Experiment*, Proc. Forth United States Microgravity Payload: One Year Report, (1999)
17. J.A. Nissen, J.A. Lipa, D.R. Swanson, P.R. Williamson, Z.K. Geng, D.A. Stricker, D. Avaloff, T.C.P. Chui, U.E. Israelsson and X. Qin, *Early results from the Confined Helium Experiments, (CHEX)*, Proc. Pan-Pacific Microgravity Meeting, Kyoto ( July 1998)
18. Quoc-Bao Vu, David A. Stricker, and Paul M. Zavracky, *Surface Characteristics of (100) Silicon Anisotropically Etched in Aqueous KOH*, J. Electrochem. Soc., Vol. 143, Issue 4, pp. 1372-1375 (April 1996)
19. X. Qin, J.A. Nissen, D. Swanson, P.R. Williamson, D.A. Stricker, J.A. Lipa, T.C.P. Chui, U.E. Israelsson, *High Resolution Thermometry for the Confined Helium Experiment*, Czech. J. Phys., **46**, 2857, (1996)
20. X. Qin, J.A. Nissen, D.R. Swanson, P.R. Williamson, D. Stricker, J.A. Lipa, T.C.P. Chui, U.E. Israelsson, *A Heat Capacity Experiment for Very High Resolution Tests of the Theory of Confined Materials*, Cryogenics, **36**, 781, (1996)
21. S. Labov, E. Silver, M. Le Gros, R.W. Bland, S.C. Dickson, T.G. Dignan, K. Laws, R.T. Johnson, M.W. Simon, D.A. Stricker, R.M. Watson, N. Madden, D. Landis, *Aluminum tunnel junction detector operation in an adiabatic demagnetization refrigerator*, International workshop on low temperature detectors and dark matter; 4-7 Sep 1991; Oxford (United Kingdom), 1992 Jan 30
22. D. A. Stricker , D.D. Bing, R.W. Bland, S.C. Dickson, T.G. Dignan, R.T., Johnson, J.M. Lockhart, K. Laws, M.W Simon, R Watson, *Particle Pulses from Superconducting Aluminum Tunnel Junction Detectors*, published in IEEE Transactions on Magnetics, March 1991, Vol. 27, No. 2: 2669-2672
23. H.S. Matis, H.G. Pugh, G.P. Alba, R.W. Bland, D.H. Calloway, S. Dickson, C.L. Hodges, T.L. Palmer, D.A. Stricker, R.T. Johnson, G.L. Shaw, R. Slansky, *Search for free quarks produced in ultra-relativistic collisions at BNL and CERN*, Conference: 8. International conference on ultrarelativistic nucleus-nucleus collisions: Quark Matter '90, Menton (France), 7-11 May 1990
24. D.A. Stricker, G.P. Alba, C.C. Anderson, D.D. Bing, R.W. Bland, S.C. Dickson, T.G. Dignan, P.Gagnon, R.T. Johnson, C.M. Seneclauze, *Characteristics of High-transmission-probability Tunnel Junctions for use as Particle Detectors*, presented at IEEE Applied Superconductivity

Conference 1988, published in IEEE Transactions on Magnetics, March 1989, Vol. 25, No. 2: 1343-1346

25. Gordon L. Shaw, Howard S. Matis, Howel G. Pugh, Richard Slansky, George P. Alba, Roger W. Bland, Stephanie C. Dickson, Christopher L. Hodges, Robert T. Johnson, Michael A. Lindgren, Teresa L. Palmer, and David A. Stricker, *Search for free quarks produced by 14.5-GeV/nucleon oxygen ions*, Phys. Rev. D **36**, 3533 (1987)