Dr. Stuart Kleinfelder, Ph.D.

Professor, Department of Electrical Engineering and Computer Science
Professor, Department of Physics and Astronomy (Joint Appointment by courtesy)
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Education:

- Ph.D. in Electrical Engineering, Stanford University, 2001.
- M.S. in Electrical Engineering, University of California, Berkeley, 1992.
- B.S. in Computer Science, State University of New York, Stony Brook, 1984.

Principal Academic and Professional Appointments:

- Professor, Department of Electrical Engineering and Computer Science (EECS), University of California, Irvine, July 2013 to present.
- Associate Professor, EECS, University of California, Irvine, July 2007 to June 2013.
- Assistant Professor, EECS, University of California, Irvine, July 2001 to June 2007.
- Staff Scientist, Physics Division, Staff Engineer: Engineering Division, Lawrence Berkeley National Laboratory, January 1991 to June 2001.

Publication Summary:

- At least 144 peer-reviewed publications including at least 73 journal publications.
- Approximately 3,000 citations to publications.

Selected Honors and Awards:

- Fellow, Institute of Electrical and Electronics Engineers (IEEE):
  "For contributions to sensors and instrumentation for high-speed imaging applications."
- IEEE Nuclear and Plasma Sciences 2009 Radiation Instrumentation Award:
  "For pioneering contributions to the development of monolithic sensors and instrumentation for Nuclear Science, Particle Physics, Particle Astrophysics and Radiation Imaging."
- Fariborz Maseeh Teaching Excellence Award, 2005.
- Teaching Innovator of the Year Award, UCI's Division of Undergraduate Education, 2002-2003.
- The IEEE's Solid-State Circuits Society lauded Dr. Kleinfelder's "Digital Pixel Sensor" as one of *"70 outstanding ideas spanning 50 years of solid-state circuits history"* and one of the 10 best ISSCC image sensor papers in 50 years.
- R&D-100 Award (then IR-100), 1991, for the MTD time-to-digital converter.

Recent University and Extra-Curricular Service:

- IEEE Nuclear Science and Plasma Society Awards Committee member, 2010-present.
- Member, Vice-Chair, Committee on Privilege and Tenure, University of California, Irvine, September 2015-August 2018.
- Member, School of Engineering Executive Committee, July 2013-June 2014.

Selected Research in Brief:

- Three decades of service in large-scale science collaborations including for the IceCube project at the South Pole, CDF and D0 at Fermilab, and numerous experiments at the Relativistic Heavy Ion Collider and at CERN, etc. Presently Co-PI of the NSF's ARIANNA ultra-high-energy neutrino experiment, including in its primary engineering management role.
- Development of medical and biological imaging technologies including for X-ray crystallography, transmission electron microscopy, single-photon and positron-emission tomography.
- Development of high-speed image sensors and instrumentation including the development of the first CMOS camera with full per-pixel analog to digital conversion and fast, highly-parallel, digital readout.

- Development of spacecraft imaging instrumentation via the Advanced Composition Explorer satellite program (Caltech, JPL, NASA); successfully launched and operating.
- The founder of VLSI design capabilities at LBL and subsequent group leader of LBL's IC design team. Successes include over a dozen mass-production runs.
- Extensive service as a technical consultant and as an expert witness in the field of image sensors.

Selected Journal Publications:

- S. W. Barwick, et al., "Design and Performance of the ARIANNA HRA-3 Neutrino Detector Systems," IEEE Trans. Nucl. Sci., Vol. 62, Issue 5, pp: 2202-2215, Oct. 2015.
- S. Kleinfelder, et al., "Multi-GHz waveform sampling and digitization with real-time pattern-matching trigger generation," IEEE Trans. Nucl. Sci., Vol. 60, No. 5, pp. 3785-3792, Oct. 2013.
- S. Kleinfelder, et al., "Design and performance of the autonomous data acquisition system for the ARIANNA high energy neutrino experiment," IEEE Trans. Nuclear Science, Vol. 60, Issue 2, pp 612-618, April 2013.
- R. Sia, S. Kleinfelder, V.V. Nagarkar, "Solid-state photon-counting hybrid detector array for high-resolution multi-energy X-ray imaging," Nuclear Instrumentation and Methods, Volume 652, Issue 1, pp 470-473, Oct. 2011.
- S. N. Ahmed et al., "The D0 Microstrip Tracker," Nuclear Instrumentation and Methods in Physics Research A, Vol 634, pp. 8-46, 2011.
- Abbasi R, et al., "The IceCube data acquisition system: Signal capture, digitization and time-stamping," Nuclear Instrumentation & Methods, Vol 601, No. 3, April 2009, pp. 294-316.
- S. Li, H. S. Matis, N. H. Xuong, S. A. Kleinfelder, "Modeling and analysis of Charged-Particle CMOS image sensor arrays," IEEE Trans. Nuclear Science, Vol. 56, No. 3, Part 2, pp. 1062-1068, June 2009.
- S. A. Kleinfelder, S. W. Chang, W. Huang, A. Shah, K. Kwiatkowski, "High-speed, high dynamic-range optical sensor arrays," IEEE Trans. Nuclear Science, Vol. 56, No. 3, Part 2, June 2009, pp. 1056-1061.
- S. A. Kleinfelder, M. Ahooie, "Integrated sensors for charged-particle imaging using per-pixel correlated double sampling," IEEE Trans. on Nuclear Science, Vol. 56, No. 3, Part 2, June 2009, pp. 1069-1075.
- S. A. Kleinfelder, S. Li, Y. Chen, "Optimization of monolithic charged-particle sensor arrays," Nuclear Instruments and Methods in Physics Research A, vol. 579, no. 2, pp. 695-700, Sept. 2007.
- A.C. Milazzo, et al., "Active Pixel Sensor Array as a Detector for Electron Microscopy," Ultramicroscopy, Vol. 104, Issue 2, pp 152-159, September 2005.
- H. S. Matis, et al., "Using an Active Pixel Sensor in a Vertex Detector," Nuclear Instruments and Methods in Physics Research A, Vol. 549, pp 130-136, 2005.
- S. A. Kleinfelder, et al., "Novel Integrated CMOS Sensor Circuits," IEEE Transactions on Nuclear Science, Vol. 51, No. 5, October 2004.
- S. A. Kleinfelder, S. Lim, X. Liu, A. El Gamal, "A 10,000 Frames/s CMOS Digital Pixel Sensor," IEEE Journal of Solid State Circuits, Volume 36, Issue 12, Dec. 2001 *(invited paper)*.
- S. A. Kleinfelder, J. T. Majors, K. A. Blumer, W. Farr, B. Manor, "The MTD132 - A New Sub-Nanosecond Multi-Hit Time-to-Digital Converter," IEEE Transactions on Nuclear Science, Volume 38, Issue 2, Part 1-2, pages 97-101, April 1991.
- S. A. Kleinfelder, "A 4096 Cell Switched Capacitor Analog Waveform Storage Integrated Circuit," IEEE Trans. Nuclear Science, Volume 37, Issue 3, Part 1:2, pages 1230-1236, June 1990.
- S. A. Kleinfelder, "Custom MOS VLSI Design; Tools And Methods," IEEE Transactions on Nuclear Science, Volume 36, Issue 1, Part 1, pages 484-492, Feb. 1989 *(invited paper)*.
- S. A. Kleinfelder, et al., "A Flexible 128 Channel Silicon Strip Detector Instrumentation Integrated Circuit with Sparse Data Readout," IEEE Trans. Nuc. Sci., Volume 36, Issue 1, Part 1, pages 171-175, Feb. 1989.
- S. A. Kleinfelder, "Development of a Switched Capacitor Based Multi-Channel Transient Waveform Recording Integrated Circuit," IEEE Trans. Nucl. Sci., Vol. 35, Issue 1, Part 1:2, pages 151-154, Feb. 1988.