

# Carl D. Meinhart

**Birth:** February 12, 1967, Effingham, Illinois

**Nationality:** USA

## Current Academic Position:

Professor, Department of Mechanical Engineering,  
University of California–Santa Barbara

## Industrial Positions:

Chief Executive Officer, Numerical Design Inc.  
Santa Barbara, CA

Co-Founder, Pi-MEMS Inc.  
Santa Barbara, CA

Chief Technology Officer, SpectraFluidics Inc. 2008 - 2011  
Santa Barbara, CA

## Education:

- Ph.D. Theoretical and Applied Mechanics; University of Illinois at Urbana-Champaign, Urbana, Illinois, October 1994  
Dissertation: *An investigation of turbulent boundary-layer structure using particle-image velocimetry.*  
Advisor: Prof. Ronald J. Adrian
- M.S. Theoretical and Applied Mechanics; University of Illinois at Urbana-Champaign, Urbana, Illinois, January 1991
- B.S. Agricultural Engineering; University of Illinois at Urbana-Champaign, Urbana, Illinois, August 1989

## Academic Honors:

- Invited Speaker, Gordon Conference: Microfluidics, Physics & Chemistry, St. Lucca, Italy, June 9 – 14, 2013.
- Fellow, APS, Nov. 2011.
- Invited speaker, International Symposium on Micro/Nano Flow Measurement Techniques – Horiba International Science Conference, Tokyo, Sept 20-22, 2010.
- Keynote Speaker, PIV'09, Melbourne, Australia, 2009
- Invited lecturer, CISM, Udine, Italy, 2008
- ASME Outstanding paper award, ASME Congress, Nov. 2007
- Outstanding Alumni Award, Lakeland College, 2007
- Invited speaker, DICP Symposium IX - Miniaturization of Analytical Instruments & micro-System, Dalian, China, 2006
- Invited speaker, 1<sup>st</sup> IEEE NEMS Conference, Zhuhai, China, 2006
- Keynote speaker, 1<sup>st</sup> Comsol Multiphysics User Conference, Boston, MA, 2005
- Keynote speaker, 6<sup>th</sup> International Conference on Particle Image Velocimetry, Pasadena, CA, 2005
- Keynote speaker, 1<sup>st</sup> Workshop on Micro-Particle Image Velocimetry, Tech. Univ. of Delft, Netherlands, 2005
- Keynote speaker, International Symposium on Micro & NanoTechnology ISMNT, Honolulu, HI, 2004.
- Invited speaker, Advances in Biological Diagnostics and Medical Applications, San Jose, CA, 2003
- Invited speaker, *Nanomedicine Technology Conferenc*, Boston, MA, 2003
- Invited speaker, European Particle Velocimetry Workshop, Zaragoza, Spain, 2003
- Invited speaker, BioMEMS & Biomedical Nanotech World, Columbus, OH, 2002
- Keynote speaker, Seiken – Particle Image Velocimetry Workshop, Tokyo, Japan, 2002
- Keynote speaker, International Symposium for Flow Visualization, Kyoto, Japan, 2002
- NSF Career Award, 1999
- Who's Who in Science and Engineering, 1997, 1998
- NASA-ASEE Summer Faculty Fellowship, 1997
- C.E. Taylor Experimental Mechanics Award, 1993
- Bronze Tablet Award 1990, FMC Fellowship, 1990

- University of Illinois Educational Fellowship, 1989
- Tau Beta Pi, 1989
- Alpha Epsilon Honorary Society, 1989
- John Deere Scholarship, 1988
- ASAE Honored Member, 1988
- Outstanding Transfer Student Award, 1987

### **Consulting Experience:**

- August 2012 – Present, Founder, CEO, Numerical Design, Inc., Santa Barbara, CA.
- August 2012 – Present, co-founder, PiMEMS, Inc., Santa Barbara, CA.
- July 2007 – Dec. 2011, co-Founder, CTO, SpectraFluidics, Inc., Santa Barbara, CA.
- May 2007 – Aug 2008, Numerical simulation of steam transport for solar energy, **Ausra**, Palo Alto, CA.
- April 2004 – March 2007, Microfluidic design of immunoassay instrumentation, **Diagnostic Product Corporation**, El Segundo, CA
- Jan. 2006 – July 2006, Design & numerical simulation of a brain catheter, **Medtronic**, Santa Barbara, CA
- Sept. 2005 – March 2006, Numerical simulation of polymeric solutions for biomedical applications, **Mentor Corp.**, Santa Barbara, CA
- Sept. 2004 – Expert witness for patent infringement, **Invitrogen**, Carlsbad, CA.
- Jan. 2004 – May 2004, Flow visualization to improve gradient gel electrophoresis analysis for cholesterol diagnostics, **Berkeley Heart Lab**, Oakland, CA.
- August 2000 – March 2004, Design of immunodiagnostic instrumentation, **ThauMDx**, Santa Barbara, CA
- July 2003 – July 2005, Numerical simulation of heat transfer in turbo machinery, **Advanced Propulsion Technology**, Santa Barbara, CA
- Jan 2000 – present, Fluid diagnostic instrumentation development, **TSI Inc.**, St. Paul, MN

### **Work Experience:**

- July 2008 – present, Professor, **University of California**, Santa Barbara, CA
- July 2000-June 2008, Associate Professor, **University of California**, Santa Barbara, CA
- July 1996-July 2000, Assistant Professor, **University of California**, Santa Barbara, CA
- June 1997-August 1997, Summer Faculty Fellow, **NASA Johnson Space Center**, Houston, TX
- July 1995-August 1996, Research Scientist, **Ford Motor Company**, Dearborn, MI
- August 1994-June 1995, Postdoctoral Research Associate, **University of Illinois**, Urbana, IL
- September 1994-October 1994, Visitor, Churchill College, **Cambridge University**, Cambridge CB 1130DS, UK
- January 1990-July 1994, Graduate Research Assistant, **University of Illinois**, Urbana, IL

### **Current Research Activities:**

- Developing micro-resolution particle image velocimetry (PIV) for measuring velocity fields in micro-scale flows
- Developing ac electrokinetic-based techniques for enhancing immunoassays and stem cell culturing
- Ti-based thermal ground planes for cooling IC chips
- Developing free surface fluidics (FSF) and combining with SERS for explosives detection

### **Current Teaching Activities:**

- Developed a senior-level undergraduate / first year graduate class on microfluidics & BioMEMS, which uses theory and numerical simulations to analyze microfluidic devices.
- Developed a sequence of graduate classes on transport phenomena that occur in macroscale and microscale flows
- Taught undergraduate laboratory classes on fluid mechanics
- Taught graduate-level classes on turbulent flows
- Taught undergraduate fluid mechanics classes

### **Reviewing and Refereeing Activity:**

- Proceedings of the National Academy of Science
- Measurement Science Technology
- Physics of Fluids
- Journal of Fluid Mechanics
- Experiments in Fluids
- ASME Journal of Fluids Engineering
- ASME - IMECE'99, 00, 01, 02, 03, 04 MEMS Symposia (review committee)
- International Workshop on PIV 99, 01, 05.
- International Symposium of Flow Visualization
- IEEE Aerospace Conference
- NSF Proposals, including a Panel Review Committees

### **Editorship:**

- Proceedings of the Third International Workshop on Particle Image Velocimetry, 1999.
- Member of editorial board Experiments in Fluids, 2004 - present

### **Conference Organization:**

- Secretary General - Third International Workshop on Particle Image Velocimetry, 1999
- Organizing Committee – Sixth International Workshop on Particle Image Velocimetry, 2005.
- Scientific Board – 13<sup>th</sup> International Symposium on the Application of Lasers to Fluid Mechanics 2006

### **Professional Societies:**

- American Physical Society
- American Society of Mechanical Engineers
- American Institute of Aeronautics and Astronautics

### **University Service:**

- Undergraduate Advisor (Department)
- Graduate Admissions & Recruitment Committee (Department)
- Design & Computing Committee (Department)
- Liaison with Industrial Development Committee (Department)
- Undergraduate Curriculum Committee (Department)
- College of Engineering Executive Committee (College)
- Ad Hoc Committee for Biomolecular Engineering (College)
- Engineering Sciences Building Committee (College)
- Lead UCSB organizer of a proposal for an NSF Engineering Research Center on Bio-MEMS (College)

### **Graduate Students Advised:**

- |                        |      |                 |
|------------------------|------|-----------------|
| • Dazhi Wang           | Ph.D | 2004            |
| • Shannon Stone        | Ph.D | 2005            |
| • Liu Xiaojun          | Ph.D | 2005            |
| • Matt Pommer          | Ph.D | 2007            |
| • Gaurav Soni          | Ph.D | 2008            |
| • Marin Sigurdson      | PhD  | 2008            |
| • Brian Piorek         | PhD  | 2008            |
| • Hope Feldman         | PhD  | 2009            |
| • Chrysafis Andreou    | PhD  | 2013 (expected) |
| • Meysam Rezaei Barmi  | PhD  | 2013 (expected) |
| • Mehran Hoonejani     | PhD  | 2014 (expected) |
| • Yu-Wei Lui           | PhD  | 2014 (expected) |
| • Eric Terry           | PhD  | 2014 (expected) |
| • Nick Judy            | PhD  | 2014 (expected) |
| • Srikumar Sheshasayee | M.S. | 1997            |
| • Hong-Sheng Zhang     | M.S. | 1999            |
| • Yang Lu              | M.S. | 2000            |
| • Marion Volpert       | M.S. | 2000            |

- Lorraine Widmann M.S. 2000
- Mike H. B. Gray M.S. 2002
- Nari Soundarrajan M.S. 2002
- Stephen Bradford M.S. 2007
- Andy Kiel M.S. 2007

### Postdoctoral Students Advised:

- Steve Wereley 9/97 – 7/99  
Current Position: Professor, Department of Mechanical Engineering, Purdue University
- Derek Tretheway 1/00 – 8/04  
Current Position: Associate Professor, Department of Mechanical Engineering, Portland State University
- Fredric Bottausci 4/02 – 1/06
- Marin Sigurdson 5/08– present  
Current Position: Postdoctoral Researcher, Dept. of Mech. Eng. University of California – Santa Barbara
- Nimisha Srivastava 10/08 – 10/10  
Current Position: Postdoctoral Researcher, Dept. of Mech. Eng. University of California – Santa Barbara

### Staff Engineer Advised:

- Marin Sigurdson 1/00 – 3/13
- Nick Judy 8/08 - present
- T.J. Reed 6/08 - 3/11

### Major Grants and Contracts:

- *C. elegans* embryos in temperature gradients, NIH, \$389k, 7/13 – 6/15 (co PI, w/ Joel Rothman)
- Nanofluidic technology for label-free bioanalytical studies, ARO, 12/12-11/13, \$200k (co-PI, w/ Pennethur).
- Microfluidic Raman strategy for rapid cellular identification and classification, ARO, 12/12-11/13, \$100k.
- Microfluidics/SERS for real-time detection of hazardous chemicals, ARO, 12/12-11/13, \$200k.
- Titanium MEMS for thermal ground planes, NSA, 8/12 – 8/13.
- High-throughput screening, sorting and enrichment of oleaginous algae using microfluidics and single-cell Raman Spectroscopy, ARO, 12/11 – 11/12, \$100k.
- Interfacial Microfluidics/SERS for high sensitivity detection using aptamer-functionalized SERS active systems, ARO, 12/11 – 11/12, \$200k.
- High-throughput screening of oleaginous algae using microfluidics, Raman and Fourier transform infrared spectroscopy, ARO, 12/10 – 11/11, \$100k
- Digital free-surface microfluidics/SERS for high sensitivity detection of biological & chemical agents, ARO, 12/10 – 11/11, \$200k.
- Free-Surface Microfluidics/SERS for high sensitivity detection of biological and chemical agents, ARO, 12/09 – 11/10, \$200k.
- Detection of Airborne Explosives with Ultra-high Sensitivity and Specificity, ARO, 4/09 – 8/12, \$2100k.
- SERS Detection for Explosives Vapor, DARPA, 4/09 – 8/10, \$500k (PI)
- Ti-Based Thermal Ground Planes, DARPA, 4/08- present, \$1750k (PI)
- Development of a Portable DNA Sensor, ARO, 5/05 – 5/08, \$2,100,000 (co-PI)
- NIRT: Titanium-Based Biomolecular Manipulation Tools, NSF, 8/04 – 7/08, \$1,000,000 (PI)
- Surface-Fluid Interactions in Micro- and Nano-Scale Channels, AFOSR, 1/04 – 12/06, \$390,856 (PI)
- AC Electrokinetic Enhancement of Bio-Sensor Performance, ARO – Institute for Collaborative Biotechnology, 9/03 – 1/07, \$251,780 (PI)
- Super-hydrophobic Surfaces in Nanochannels, Los Alamos National Lab, 1/04 – 12/04, \$100,000 (co-PI)
- An Integrated Tunable Laser Cavity Sensor for Immunoassay Analysis and Molecular Diagnostics, DARPA, 7/00 – 6/04, \$1,500,000 (PI)

- ITR/ACS: Computational Infrastructure for Microfluidic Systems with Applications to Biotechnology, NSF, 9/00 – 8/04, \$2,900,000 (Co-PI)
- Experimental Analysis of Dielectrophoresis in Microchannels, DARPA / Stanford, 7/00 – 3/04, \$185,000 (PI)
- Equipment Grant for Micro Mixing, NSF, 10/99 – 9/01, \$105,000 (Co-PI)
- MEMCAD software donation, Microcosym, 9/99 – 9/00, \$70,000 (commercial value) (PI)
- Fluid Mechanics of Microscale Engineering Systems, NSF Career Award, 7/98 – 6/04, \$225,000 (PI)
- Optical Diagnostic Techniques for Micro-Mixing Devices, DARPA / UIUC, 7/98 – 6/01, \$191,807 (PI)
- Development of Micro-Resolution PIV and Analysis of Microthrusters for Small-Scale Aircraft and Spacecraft, AFOSR, 7/97 – 6/00, \$313,001 (PI)
- Velocimetry to Microfluidic Devices for Space Exploration, Jet Propulsion Laboratory, 1/98 – 12/99, \$63,000 (PI)

### **Minor Grants and Contracts:**

- Microfluidic Genetic Diagnostics, Tamarisc, 1/06 – 10/06, \$2,000
- Fluid Mechanics Research, Ford Motor Company, 9/96 - present, \$30,000
- Microfluidics Research, Seiko-Epson, 9/98 – present, \$4,300
- PIV Analysis of SEA-JET Nozzles, Seiko-Epson, 10/98 – 3/99, \$23,809
- Support for the Third International Workshop on PIV, NSF, 1/99 – 12/99, \$10,000
- Support for the Third International Workshop on PIV, NASA, 1/99 – 12/99, \$10,000
- Support for the Third International Workshop on PIV, ONR, 1/99 – 12/99, \$5,000
- Support for the Third International Workshop on PIV, Ford Motor Company, 1/99 – present, \$3,500
- Fluid Mechanics for Microscale Systems, Ford Motor Company, 9/99 – present, \$10,000

### **Invited Seminar Presentations:**

- Gordon Conference: Microfluidics, Physics & Chemistry, June 9 – 14, 2013.
- Mechanical Engineering Seminar, UCSB, May 6, 2013.
- MLT Seminar Series, Massachusetts Institute of Technology, April 9, 2013.
- Invenios, Santa Barbara, CA, May 24, 2013.
- MF-4 Fourth Microfluidics Consortium, UCSB, Feb. 1, 2013.
- Mechanical Engineering Seminar, UCR, Riverside, CA, Jan. 24, 2013.
- Eastern Analytical Symposium, Somerset, NJ, Nov. 15, 2011.
- NNIN/C Michigan Symposium: Advanced Modeling and Simulation of NEMS/MEMS and Nano/Microfluidic Devices, Ann Arbor, MI, April 19 – 20, 2011.
- Raytheon, El Segundo, CA, Jan. 21, 2011.
- International Symposium on Micro/Nano Flow Measurement Techniques – Horiba International Science Conference, Tokyo, Sept 20-22, 2010.
- 8th International Conference on PIV, Melbourne, Australia, 2009
- Arizona State University, Tempe, AZ, 2008
- University of Padua, Padua, Italy, 2008
- International Centre for Mechanical Sciences (CISM), Udine, Italy, 2008
- ARL-SEDD, Adelphi, MD, 2008
- ECBC, Edgewood, MD, 2008
- CERDEC-NVESB, Belvoir, VA, 2008
- Technical University of Denmark, Copenhagen, Denmark, 2008
- Army Science Conference, ICB, Santa Barbara, CA, 2008
- California Institute of Technology, Pasadena, CA, 2007
- Agilent Technologies, Santa Clara, CA, 2007
- SRI, Menlo Park, CA, 2007
- Univ. of Penn, Philadelphia, PA, 2006
- Lisbon, Portugal, 2006
- DICP, Dalian, China, 2006
- Tsinghua University, China, 2006
- Chinese Institute of Non-linear Mechanics, Beijing, China, 2006
- 1<sup>st</sup> IEEE NEMS Conference, Zhuhai, China, 2006
- 1<sup>st</sup> Comsol Multiphysics Users Conference, Boston, MA, 2005

- Harvard University, Cambridge, MA, 2005.
- 6<sup>th</sup> International Conference on Particle Image Velocimetry, Pasadena, CA, 2005
- Wright Patterson Airforce Base, Dayton, OH, 2005.
- Center for Tribology Research, Inc., Campbell, CA, 2005.
- Technical University of Delft, The Netherlands, 2005.
- Stanford University, Stanford, CA, 2004
- University of Florida, Gainesville, FL, 2004
- Workshop for BioSensors, Army Research Office, Rayleigh, NC, 2004
- Adelphi Laboratory Center, US Army Research Laboratory, Adelphi, MD, 2004
- International Symposium on Micro and NanoTechnology ISMNT-1, Honolulu, HI, 2004
- Diagnostics Product Corporation, Los Angeles, CA, 2004
- Association of Laboratory Automation, San Jose, CA, 2004
- Department of Mechanical & Aerospace Engineering, UCLA, Westwood, CA, 2003
- Thermal Systems Incorporated, Bay Area, CA, 2003
- Microfluidics History, Theory and Applications, International Centre for Mechanical Sciences, Udine, Italy, 2003.
- National Institutes of Health, Rockville, MD, 2003
- American Society of Mechanical Engineers – Summer Meeting, Honolulu, HI, 2003.
- National Institute of Standards and Technology, Gaithersburg, MD, 2003
- Advances in Biological Diagnostics and Medical Applications, Knowledge Foundation, San Jose, CA, 2003
- AFOSR Workshop on Microfluidics, University of Southern California, Los Angeles, CA, 2003
- Nanomedicine Technology, Cambridge Healthtech Conference, Boston, MA, 2003
- Department of Mechanical Engineering, University of Ohio, Columbus, OH, 2003
- Euro PIV Workshop, Zaragoza, Spain, 2003
- California Nanosystems Institute, UCSB, Santa Barbara, CA, 2003
- Department of Aerospace Engineering, University of Minnesota, Minneapolis, MN, 2003
- American Institute of Aeronautics and Astronautics – Winter Meeting, Reno, ND, 2003
- DLR, Göttingen, Germany, 2002
- American Institute of Chemical Engineers, Indianapolis, IN, 2002
- SBCOMM – US ARMY, Aberdeen Proving Grounds, MD, 2002
- BioMEMS & Biomedical Nanotech World, Columbus, OH, 2002
- International Symposium on Flow Visualization, Kyoto, Japan, 2002
- SEIKEN PIV Workshop, Tokyo, Japan, 2002
- Seoul National University, Seoul, Korea, 2002
- Busan National University, Busan, Korea, 2002
- Kaist University, Daejeon, Korea, 2002
- LG Electronics, Seoul, Korea, 2002
- Dantec Short Course on PIV, Montreal, Canada, 2002
- TSI, Inc., Minneapolis, MN, 2002
- Technical University of Delft, Delft, The Netherlands, 2001
- M.D. Anderson Cancer Research Center, Houston, TX, 2001
- University of Michigan, Ann Arbor, MI, 2001.
- AIAA Aerospace Sciences Meeting, Reno, NV, 2001
- Purdue University, West Lafayette, IN, 2000.
- University of Houston, Houston, TX, 1999
- University of Illinois, Urbana, IL, 1999
- ASME / JSME Fluid Dynamics Meeting, San Francisco, CA, 1999
- DOD-Wide MEMS Meeting, Salt Lake City, UT, 1999
- AIAA Fluid Dynamics Conference, Norfolk, VA, 1999
- Small Talk 99 Conference, San Diego, CA, 1999
- Epson Corporation, Matsumoto, Japan, 1999
- University of California, Santa Barbara, 1999
- Bay Area MEMS Journal Club, Santa Clara, CA, 1999
- University of California, Santa Barbara, CA, 1999

- Stanford University, Stanford, CA, 1998
- Motorola Corporation, Tempe, AZ, 1998
- Epson Corporation, Matsumoto, Japan, 1998
- University of Southern California, Los Angeles, CA, 1998
- Lawrence Livermore National Laboratory, Livermore, CA, 1997
- Johnson Space Center - NASA, Houston, TX, 1997
- University of California, San Diego, CA, 1996
- The Aerospace Corporation, El Segundo, CA, 1996
- University of California, Santa Barbara, CA, 1996
- Ford Motor Company, Dearborn, MI, 1995
- University of Maryland, College Park, MD, 1994
- Stanford University, Palo Alto, CA, 1994
- Imperial College, London, UK, 1994
- DLR, Göttingen, Germany, 1994
- Delft University of Technology, Delft, The Netherlands, 1994
- The Technical University of Denmark, Charlottenlund, Denmark, 1994
- Illinois Institute of Technology, Chicago, IL, 1994
- University of Illinois, Urbana, IL, 1994
- Army Research Laboratory, Aberdeen, MA, 1994
- NASA Langley, Hampton, VA, 1993
- University of Illinois, Urbana, IL, 1992
- TSI, Inc., Minneapolis, MN, 1992

### Patents:

- C. D. Meinhart**, J. G. Santiago, S. T. Wereley, and R. J. Adrian. Micron resolution particle image velocimeter, Patent No. 6,653,651 Issued Nov. 25, 2003.
- C. D. Meinhart**, L. Coldren, & T. Stultz. Integrated Sensor. Patent No. 6,899,849, Issued May 31, 2005.
- C. D. Meinhart**, J. G. Santiago, S. T. Wereley, and R. J. Adrian. Depth-of-field micron resolution velocimetry with pulsed images of injected solid particles. Patent No. 7,057,198, June 6, 2006.
- C. D. Meinhart**, B. Piorek, S. J. Lee. M. Moskovits, Sanjoy Banerjee, J. G. Santiago. Device and methods of detection of airborne agents. Patent No. US 8,017,408 B2, Issued Sept. 13, 2011.
- C. D. Meinhart**, B. Piorek, S. J. Lee. M. Moskovits, Sanjoy Banerjee, J. G. Santiago. Device and methods of detection of airborne agents. Patent No. US 8,247,238 B2, Issued Aug. 21, 2012.
- C. D. Meinhart**, B. Piorek, S. J. Lee. M. Moskovits, Sanjoy Banerjee, J. G. Santiago. Device and methods of detection of airborne agents. Patent No. US 8,431,409 B2, Issued April 30, 2013.
- Payam Bozorgi, **Carl D. Meinhart**, Marin Sigurdson, Noel C. MacDonald, David Bothman, Yu-Wei Liu. Methods and apparatus for transport of airborne molecules using an active cyclical vapor/liquid exchange, Patent No. 8792095, Issued July 29, 2014.

### Archival Publications:

- Marshall, L.A., Rogacs, A., **Meinhart, C.D.**, and Santiago, J.G. An injection molded microchip for nucleic acid purification from 25 microliter samples using isotachopheresis. *J. Chromatography A*, 2014, <http://dx.doi.org/10.1016/j.chroma.2014.01.036>.
- Barmi, M. and **Meinhart, C.D.** Convective flows in evaporating sessile droplets. *J. Phys. Chem. B*, 2014, 118, 2414-2421, [dx.doi.org/10.1021/jp408241f](http://dx.doi.org/10.1021/jp408241f).
- Piorek, B. D., Andreou, C. Moskovits, M., Meinhart, C.D. Discrete free-surface microfluidics for rapid capture and analysis of airborne molecules using surface-enhanced Raman spectroscopy. *Anal. Chem.* 2014, 86, 1061-1066. [dx.doi.org/10.1021/ac402628t](http://dx.doi.org/10.1021/ac402628t).
- Barmi, M.R., Andreou, C., Hoonejani, M.R., Moskovits, M., **Meinhart, C.D.** Aggregation kinetics of SERS-active nanoparticles in thermally stirred sessile droplets. *Langmuir*, 2013, 29, 13614-13623. [dx.doi.org/10.1021/la400949x](http://dx.doi.org/10.1021/la400949x).
- Andreou, C., Hoonejani, M.R., Barmi, M.R., Moskovits, M., **Meinhart, C.D.** Rapid detection of drugs of abuse in saliva using surface enhanced Raman spectroscopy and microfluidics. *ACS Nano*, Vol. 7, No. 8, pp. 7157-7164, 2013.

- Pallaoro, A., Hoonejani, M. R., Braun, G. B., Meinhart, C. D., Moskovits, M. 2013 Combined SERS biotages (SBTs) and microfluidic platform for the quantitative radiometric discrimination between noncancerous cells in flow, *J. Nanophotonics*, Vol. 7, DOI 10.1117/1JNP.7.073092.
- Sigurdson, M., Liu, Y.W., Bozorgi, P. Bothman, D. MacDonald, N., Meinhart, C.D. 2013 A large scale titanium thermal ground plane, *Int. J. Heat Trans.* 62, pp. 178-183, <http://dx.doi.org/10.1016/j.ijheatmasstransfer.2013.01.064>.
- Piorek, B., Lee, S.-J., Moskovits, M. and Meinhart, C.D. 2012. Free-surface microfluidics / SERS for real-time vapor detection of explosives, *Anal. Chem.* 84, 9700-9705.
- Loire, S, Kauffmann, P, Mezic, I, Meinhart, C. D. 2012. A theoretical and experimental study of ac electrothermal flows. *J. of Physics D*, Vol. 45, No. 18, DOI 10.1088/022-3727/45/18/185301, May 9.
- Arkadij M. Elizarov & Carl Meinhart & Reza Miraghaie, R. Michael van Dam & Jiang Huang & Antoine Daridon, James R. Heath & Hartmuth C. Kolb. 2011. Flow optimization study of a batch microfluidics PET tracer synthesizing device. *Biomed. Microdevices*, 13(1):231-42.
- Luni, C., Feldman, H.C, Pozzobon, M., Coppi, P.D., Meinhart, C.D., Elvassore, N. 2010. Microliter-bioreactor array with buoyancy-driven stirring for human hematopoietic stem cell culture, *Biomicrofluidics*, 4 (3).
- Ding, C., Soni, G., Bozorgi, P., Piorek, B., Meinhart C.D., MacDonald, N. 2010 A Flat heat pipe based on nanostructured titania, *JMEMS*, 19, 4, pp. 1057-7157.
- Lee, SJ, Piorek, B., Meinhart, C.D., Moskovits, M. 2010. Photoreduction at a Distance: Facile, Nonlocal Photoreduction of Ag Ions in Solution by Phasmon-Mediated Photoemitted Electrons. *Nano Lett.* 10, 1329-1334.
- Srivastava, N., Ding, C., Judson, A., MacDonald, N., and Meinhart, C.D. 2010. A unified scaling model for flow through a lattice of microfabricated posts, *Lab on a Chip*, 10, 1148-1152.
- Wereley, S.T. and Meinhart, C.D. 2010. Recent Advances in Micro-Particle Image Velocimetry, *Annu Rev. Fluid Mech* 42:557-76.
- Meinhart, C.D and Wereley, S.T. 2010. Micro-resolution Particle Image Velocimetry. In Microfluidics, Nanooptics and Surface Chemistry, Ed. Chih-Ming Ho.
- Gregersen, M.M., Andersen, M.B., Soni, G., Meinhart, C.D., Bruus, H. 2009, Numerical analysis of finite Debye-length effects in induced-charge electro-osmosis, *Phys. Rev. E*, 79, 066316.
- Pommer, M, Zhang, Y., Keerthi, N, Chen, D, Thomson, JA, Meinhart, CD, Soh, HT. 2008. Dielectrophoretic separation of platelets from diluted whole blood in microfluidic channels. *Electrophoresis*. Vol. 29, No 6, pp. 1213-8.
- Hsiang-Wei Lu, Frederic Bottausci, Jesse D Fowler, Andrea L Bertozzi, Carl Meinhart, Chang-Jin Cj Kim. 2008. A study of EWOD-driven droplets by PIV investigation. *Lab on a Chip*, Vol. 8 (3), pp. 456-61.
- Pennathur, S., Meinhart, C.D., and Soh, T.H. 2008. How to Exploit the Features of Microfluidics Technology. *Lab on a Chip* Vol. 8, 20-22.
- Kristiansen, K., McGuiggan, P., Carver, G., Meinhart, C, Israelachvili, J. 2007. 3D Force and Displacement Sensor for SFA and AFM Measurements. *Langmuir*, 24 (4), pp. 1541-1549.
- Piorek, B.D, Lee, S.-J., Santiago, J.G., Moskovits, M., Banerjee, S. & **Meinhart, C. D.** 2007 Free-surface microfluidic control of surface enhanced Raman spectroscopy for the optimized detection of airborne molecules *Proc. Nat. Acad. Sci.* 104, 18898-18901.
- Feldman, H., Sigurdson, M., **Meinhart, C.D.** 2007. AC electrothermal enhancement of heterogeneous assays in microfluidics, *Lab on a Chip*. Vol. 7, pp. 1553.
- Freudenthal, P., Pommer, M., **C.D. Meinhart**. 2007. Quantum Nanospores for Sub-Micron Velocimetry, *Exp in Fluids*, Vol. 43, No 4.
- Bottausci, F., Cardonne, C., **Meinhart, C.**, Mezic, I. 2007. An Ultrashort Mixing Length Micromixer: The Shear Superposition Micromixer, *Lab on a Chip*. 2007, 7, 396 - 398
- Wereley, S. T. & **Meinhart, C. D.** 2007 Micro-PIV. In *Particle Image Velocimetry: A Practical Guide*, by M. Raffel, C. Willert, S. Wereley, J. Kompenhans, Springer, New York (2007).
- Parker, E.R., Rao, M. P., Turner, K. L., **Meinhart, C. D.**, MacDonald, N.C., 2006 Bulk Micromachined Titanium Microneedles, *JMEMS*, Vol. 16, No. 2, pp. 289.
- Piorek, B., Mechler, A., Freudenthal, P., Lal, R., **Meinhart, C.D.**, Banerjee, S. 2006. Nanoscale resolution microchannel velocimetry by atomic force microscopy. *Applied Physics Letters*, 89, 153123.
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