

Ioannis Kymissis

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EDUCATION

Ph.D. in Electrical Engineering and Computer Science, May 2003
Massachusetts Institute of Technology, Cambridge, MA
Thesis title: Field Emission from Organic Materials
Advisor: Prof. Akintunde I. Akinwande

M.Eng. in Electrical Engineering and Computer Science, May 1999
Massachusetts Institute of Technology, Cambridge, MA
Thesis title: Morphology and Performance in Pentacene
Advisor: Prof. Akintunde I. Akinwande
Co-op with IBM Research Laboratories, Yorktown Heights, NY

S.B. in Electrical Engineering and Computer Science, May 1998
Massachusetts Institute of Technology, Cambridge, MA

EMPLOYMENT

Research Assistant MIT
Microsystems Technology Cambridge, MA
Laboratory 1999 – 2003

Thesis: Field Emission from Organic Semiconductors. Advisor: Tayo Akinwande

Summer Intern Yamato, Japan
IBM Research, Tokyo Research Lab Summer 1999
Advisor: Yoichi Taira

Co-op Student Yorktown Heights, NY
IBM Research, T. J. Watson 1996-1999
Research Lab
Advisors: Christos Dimitrakopoulos and Sampath Purushothaman

AWARDS

2018 40 under 40, Greek America Foundation
2018 Fellow, Society for Information Display
2017 Architizer A+ Award (Radiator Labs)
2016 Finalist, Verizon Powerful Answers Award (Chromation)
2015 Winner, Verizon Powerful Answers Award (Radiator Labs)
2014 National Academy of Engineering, Frontiers of Engineering Education Meeting Attendee
2014 National Academy of Engineering, Indo-American Frontiers of Science Meeting Attendee
2014 Popular Science, Invention of the Year (Radiator Labs)
2013 IBM faculty award
2012 Interdigital Innovation Challenge, first prize
2012 MIT/USDOE Clean Energy Prize, first prize
2011 Ocean Optics Blue Ocean Award
2011 Kim Award for Undergraduate Involvement
2010 IBM Faculty award
2009 Vodaphone Americas Foundation Wireless Innovation Award

2008 Google faculty award
2007 NSF CAREER award
2002 IVMC Shoulders Gray Spindt award
1998-2002 IBM Fellowship
2002 IBM Research First Plateau
2002 IBM Outstanding Technical Achievement Award
2000-2002 IBM Invention Achievement Award
1997 Tau Beta Pi, Eta Kappa Nu

BEST
PAPER/POSTER
AWARDS

2018 CMOC Best poster award
2015 IDW Distinguished Paper Award
2015 NYC Media Lab Best Demo award
2014 FlexTech Alliance, second place best poster
2014 Global Interposer Technology Conference, second place best poster
2013 IGERT workshop on Energy, Transportation, and Water Infrastructure 3rd place poster
2012 MRS Fall Meeting Best Poster finalist
2011 ACM SenSys'11 Best Student Demo Award
2011 IEEE Communications Society Award, Best Paper
2002 IEEE Electron Device Society Paul Rappaport Award

BOOK

Ioannis Kymissis (monograph). *Organic Field Effect Transistors: Theory, Fabrication and Characterization* Springer, New York, 2009.

PUBLICATIONS
(SELECTED)

For a complete list visit <http://www.researcherid.com/rid/A-5994-2010> or <https://scholar.google.com/citations?user=WCfE80C7d5MC&hl=en&oi=ao>

104. Yang, Shyuan, Johannes Binting, Steve Park, Sejal Jain, Kostas Alexandrou, Philipp Fruhmann, Kalpana Besar, Howard Katz, and Ioannis Kymissis. "Inexpensive, Versatile, and Robust USB-Driven Sensor Platform." *IEEE Sensors Letters* 1, no. 6 (2017): 1-4.

103. Evan S. O'Brien, M. Tuan Trinh, Rose L. Kann, Jia Chen, Giselle A. Elbaz, Amrita Masurkar, Timothy L. Atallah, Maria V. Paley, Nilam Patel, Daniel W. Paley, Ioannis Kymissis, Andrew C. Crowther, Andrew J. Millis, David R. Reichman, X.-Y. Zhu, Xavier Roy 2017. Single-crystal-to-single-crystal intercalation of a low-bandgap superatomic crystal. *Nature chemistry*, 9(12), p.1170.

102. Li, Jiangyi, Jae-sun Seo, Ioannis Kymissis, and Mingoo Seok. "Triple-Mode, Hybrid-Storage, Energy Harvesting Power Management Unit: Achieving High Efficiency Against Harvesting and Load Power Variabilities." *IEEE Journal of Solid-State Circuits* 52, no. 10 (2017): 2550-2562.

101. "A Hybrid Electronic Nose and Tongue for the Detection of Ketones: Improved Sensor Orthogonality Using Graphene Oxide-Based Detectors" Cavallari MR, Braga GS, da Silva MF, Izquierdo JE, Paterno LG, Dirani EA, Kymissis I, Fonseca FJ. *IEEE Sensors Journal* Volume: 17 Issue: 7 Pages: 1971-1980 2017

100. "Color Fine-Tuning of Optical Materials Through Rational Design" Holzer B, Binting J, Lumpi D, Choi C, Kim Y, Stger B, Hametner C, Marchetti Deschmann M, Plasser F, Horkel E, Kymissis I. *ChemPhysChem* Volume: 18 Issue: 5 Pages: 549-

99. "Graphene-organic hybrid electronics" Kim, Chang-Hyun; Kymissis, Ioannis. *Journal of Materials Chemistry C* Volume: 5 Issue: 19 Pages: 4598-4613 2017 DOI: 10.1039/c7tc00664k
98. "Monolithically Integrated CMOS-SMR Oscillator in 65 nm CMOS Using Custom MPW Die-Level Fabrication Process" Edrees, Hassan M.; Colon-Berrios, Aida R.; Peixoto, Daniel de Godoy, Shepard, Kenneth; Kinget, Peter; Kymissis, Ioannis. *Journal of Microelectromechanical Systems* Volume: 26 Issue: 4 Pages: 846-858 2017 DOI: 10.1109/JMEMS.2017.2691585
97. "Permanent water swelling effect in low temperature thermally reduced graphene oxide" Papamatthaiou, S.; Argyropoulos, D. -P.; Masurkar, A. M. R. Cavallari, F. Farmakis, I. Kymissis, and N. Georgoulas. *Applied Physics Letters* Volume: 110 Issue: 25 2017 DOI: 10.1063/1.4989681
96. "Synthesis, characterization and printing application of alkylated indolo[3,2-b]carbazoles" Johannes Bintingera, Shyuan Yang, Philipp Fruhmann, Brigitte Holzer, Berthold Stger, Anastasiya Svirikova, Martina Marchetti-Deschmann, Ernst Horkel, Christian Hametner, Johannes Frohlich, Ioannis Kymissis, and Hannes Mikula. *Synthetic Metals* Volume: 228 Pages: 9-172017 DOI: 10.1016/j.synthmet.2017.04.003
95. "Unexpected length dependence of excited-state charge transfer dynamics for surface-confined perylenediimide ensembles" Amir Mazaheripour,a Gregor Kladnik,bc Jonah-Micah Jocson, Austin G. Wardrip, Cade B. Markegard, Nathan Frey, Albano Cossaro, Luca Floreano, Alberto Verdini, Andrew Bartlett, Anthony M. Burke, Nina Hsken, Kelsey Miller, Katarina Van Wonterghem, Robert Lopez, Michelle Lu, Amrita Masurkar, Mary N. Dickson, Sahar Sharifzadeh, Hung D. Nguyen, Ioannis Kymissis, Dean Cvetko, Alberto Morgante and Alon A. Gorodetsky *Materials Horizons* Volume: 4 Issue: 3 Pages: 437-441 2017 DOI: 10.1039/c6mh00465b
94. "The Effect of Thermal Reduction and Film Thickness on fast Response Transparent Graphene Oxide Humidity Sensors, S Papamatthaiou, D-P Argyropoulos, F Farmakis, A Masurkar, K Alexandrou, I Kymissis, N Georgoulas. *Procedia Engineering* 168 301-304 (2016)
93. "Color Fine Tuning of Optical Materials Through Rational Design" Brigitte Holzer, Johannes Binting, Daniel Lumpi, Christopher Choi, Youngwan Kim, Berthold Stoger, Christian Hametner, Martina Marchetti-Deschmann, Felix Plasser, Ernst Horkel, Ioannis Kymissis, Johannes Frhlich. *ChemPhysChem* (ASAP)
92. "An Intracochlear Pressure Sensor as a Microphone for a Fully Implantable Cochlear Implant" Francis Pete X Creighton, Xiyang Guan, Steve Park, Ioannis John Kymissis, Hideko Heidi Nakajima, Elizabeth S Olson. *Otology & Neurotology* 37(10) 1596-1600

RECENT
CONFERENCE
PRESENTATIONS/
POSTERS/ DEMOS

Colon-Berrios, Aida R., Hassan Edrees, Daniel De Godoy, Peter Kinget, and Ioannis Kymissis. "Die-level processing for 3-D monolithic integration of piezoelectric MEMS on CMOS." In *SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S)*, 2017 IEEE, pp. 1-3. IEEE, 2017.

Liang, W., Alexandrou, K., Klebanov, M., Kuo, C. C., Kymissis, I., Sundaram, K. B., Liou, J. J. (2017, July). Characterization of ESD protection devices under total ionizing dose irradiation. In *Physical and Failure Analysis of Integrated Circuits (IPFA)*, 2017

IEEE 24th International Symposium on the (pp. 1-4). IEEE.

(Invited) Integrated Light Management as a Path to Miniaturizing Spectrometers Nadia K. Pervez, Tanya C. Garza, Michael J. Gazes, James I. Scholtz, Mark F. Comerford, and Ioannis Kymissis Imaging and Applied Optics 2017 (3D, AIO, COSI, IS, MATH, pcAOP) OSA Technical Digest (online) (Optical Society of America, 2017), paper ATh2A.3

(invited) National Research Center, Athens, Greece

(Invited) 2018 Workshop on smell sensing, AIT Tullin, Austria

(invited) ICDM 2018, "Surface treatment for OFETs" Guangzhou, China

(short course) ICDM 2018, "MicroLEDs" Guangzhou, China

(Invited) CMOC 2018, New Haven, CT

(invited) IWPSD, "X-ray analysis of OFETs" New Delhi, India

(short course) IWPSD, "Quantum Dots in Displays" New Delhi, India

(Keynote, panelist) Boston HubWeek 2017

(Invited) SID Annual Symposium 2017

(Invited, plenary speaker) 2017 Hai'an Workshop on Microelectronics, Hai'an China

Colon-Berrios AR, Edrees H, McGinn C, Cavallari MR, Kinget P, Kymissis I. CMOS integrated ZnO thin film bulk acoustic resonator with Si₃N₄ susceptor layer for improved IR sensitivity. Device Research Conference (DRC), 2017

Bahamonde JA, Colon AR, Krishnaswamy H, Kymissis I. Acoustoelectric amplification of surface acoustic waves on ZnO deposited on AlGa_N/Ga_N Epi. Device Research Conference (DRC), 2017

US PATENTS
(SELECTED FROM
31)

US Patent 9,863,979 Systems, apparatus, and methods for energy monitoring Ioannis Kymissis, Shyuan Yang, Jun Shimada, Fabio Carta

US Patent 9,431,623 Flexible devices including semiconductor nanocrystals, arrays, and methods Peter Kazlas, Marshall Cox, Seth Coe-Sullivan, Ioannis Kymissis

US Patent 9,420,701 Flexible direct or USB plug-in platform for foldable or flexible electronics Shyuan Yang, Ioannis Kymissis

US Patent 9,390,920 Composition including material, methods of depositing material, articles including same and systems for depositing material Seth Coe-Sullivan, Maria Anc, Leeann Kim, John Ritter, Marshall Cox, Craig Breen, Vladimir Bulovic, Ioannis Kymissis, Robert Praino, Peter Kazlas, July 2016

US Patent 9,366,571 Photonic crystal sensor apparatus and techniques, Pervez; Nadia, Kymissis; Ioannis, Jia; Zhang, Cox; Marshall, July 2016

US Patent 9,293,553 Graphene electrodes for electronic devices Cox; Marshall, Kymissis; Ioannis, Gorodetsky; Alon, Han; Melinda Y. , Nuckolls; Colin P., Kim; Philip, March 2016

US Patent 9,257,606 Direct bandgap substrates and methods of making and using. Vincent Lee, Ioannis Kymissis, February 2016

US Patent 9,255,912 Monolithic FBAR-CMOS structure such as for mass sensing. Ken

Shepart, Matthew Johnston, Ioannis Kymissis. February 2016

UNIVERSITY LEADERSHIP	CNI Shared Facilities Director (2016-present) Faculty advisor, TBP (2016-present) Faculty advisor, Columbia Space Initiative (2015-present) Faculty in Residence, Hartley Hall/first-year zone (2012-present) Columbia Maker Space, Director (2014-present) Nano Initiative co-chair (2014-2016) CISE/Columbia Nano Initiative executive committee (2012-present) EFRC: Thrust leader and executive committee member (2008-2014) Institute for Data Sciences and Engineering: Space planning committee (2012-present) Columbia University Cleanroom Committee (2008-present) NSEC: Outreach and education committee member (2008-2010) Columbia Environmental Health and Safety Faculty Working Group (2008-2015)
EXTERNAL COMMITTEES	IMID: Program committee 2018 ICDT: International Advisory Board 2018 IDW: Program committee 2018, 2017, 2016, 2015 SID: EMD program committee 2018, 2017, 2016, 2015 SIGGRAPH: External reviewer 2018, 2017 EMC: Program committee 2018, 2017, 2016 IEDM: Program committee 2016, 2015, 2014 MRS: Symposium organizer 2019, 2015, 2013, 2011, 2009, 2007 DRC: GenChair 2014, TPC Chair 2013, TPC VC 2012, TPC member 2011, on board (2014-present) SPIE: Symposium organizer 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2010, 2009, 2003 LOPE-c: VP Americas/program committee 2014, 2013, 2012, 2011 IEEE/MRS/ACS Organic Electronics Workshop: Executive committee 2009-2011 SID-MAC Workshop on Organic and Thin Film Electronics, chair, 2009 CS/IEEE/MRS North East Regional Meeting, co-organizer, 2006 International Vacuum Nanoelectronics Conference: Local arrangements 2004
EDITORIAL POSITIONS	Publication chair, Society for Information Display (SID) 2015-present Editor in Chief, Journal of the Society for Information Display (JSID). 2012-2015 Associate Editor, Journal of the Society for Information Display (JSID). 2015-present Associate Editor, KIDS Journal of Information Display (KIDS JID). 2011-present Associate Editor, IEEE Transactions on Electron Devices (IEEE TED). 2014-present
ELECTED POSITIONS	Armstrong Memorial Research Foundation, Secretary 2016-present Secretary, Society for Information Display. 2018 - present VP Americas East, Society for Information Display. 2017-2018 IEEE EDS Regions 1-3 & 7 SRC Vice Chair; IEEE Electron Device Society. 2012-2017 Director, Society for Information Display, Mid Atlantic Chapter. 2012-2017 Publication Chair, Society for Information Display. 2015-present Chairman, EDS Vice-chair. IEEE New York Section Electron Device/Solid State Circuit Society Joint Chapter. 2007-present Secretary, Treasurer, Vice-chair, Chair. Society for Information Display, Mid Atlantic Chapter. 2007-2011
GRADUATE THESES SUPERVISED	Completed: “Charge Injection and Transport in Pentacene Field-Effect Transistors” Columbia University EE, Amrita Masurkar 2016 (PhD) “Monolithically Integrated Acoustic Resonators on CMOS for Radio-Frequency Circuit

Applications” Columbia University EE, Hassan Eddrees 2016 (PhD)
 “Ionizing Radiation Effects on Graphene Based Field Effects Transistors” Columbia University EE, Kostas Alexandrou 2016 (PhD)
 “Optimization of Printed Electronics”, Columbia University EE, Shyuan Yang 2015 (PhD)
 “Excimer Laser Crystallization of Silicon Thin Films for Monolithic 3D Integration”, Columbia University EE, Fabio Carta 2015 (PhD)
 “Harvest,” School of Visual Arts, MFA Damon Ahola, 2014 (MS)
 “Organic photovoltaic device architectures”, Columbia University EE, Jonathan Beck 2013 (PhD)
 “Systems for Pervasive Electronics and Interfaces”, Columbia University EE, John Sarik 2013 (PhD)
 “Electrowetting on dielectrics”, Columbia University EE, Haig Norian (Co-supervised with Ken Shepard) 2013 (PhD)
 “Processes and Materials for Organic Photovoltaics”, Columbia University EE, 2012, Marshall Cox. (PhD)
 “Ultrasound Data Communications for Ultra-low-power Wake-up in Sensor Nodes”, Columbia University EE, 2012, Kshitij Yadav. Co-supervised with Peter Kinget. (PhD)
 “Advanced Integration of Devices Enabled by Laser Crystallized Silicon”, Columbia University EE, 2012, Vincent Lee. (PhD)
 “The Integration and Applications of Organic Thin Film Transistors and Ferroelectric Polymers” Columbia University EE, 2012, Yu-Jen Hsu. (PhD)
 “Interfacial Studies in Organic Field-Effect Transistors”, Columbia University APAM, 2011, Zhang Jia. (PhD)

In progress:

Columbia University EE, Aida Colon
 Columbia University EE, Christopher Choi
 Columbia University EE, Jose Bhanmode
 Columbia University APAM, Peter Bullen
 Columbia University EE, Caroline Yu
 Columbia University EE, Christine McGinn
 Columbia University EE, Keith Behermann

POST-DOCTORAL ASSOCIATES SUPERVISED Sung-Jin Kim (Chungbuk National University)
 Nadia Pervez (Chromation)
 Brian Tull (Lumiode)
 Htay Hliang (Dupont)
 En-Chen Chen (KLA-Tencor)
 Steve Park (KAIST)
 Marco Roberto Cavallari (University of Sao Paolo)

POST-DOCTORAL ASSOCIATES CO-SUPERVISED Theanne Schiros (SUNY/FIT)
 Robert Barton (Amazon)
 Octavi Semonin (Alta Devices)