

# Stanford

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## Thomas Lee

Professor of Electrical Engineering

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### Bio

#### BIO

Professor Lee's principal areas of professional interest include analog circuitry of all types, ranging from low-level DC instrumentation to high-speed RF communications systems. His present research focus is on CMOS RF integrated circuit design, and on extending operation into the terahertz realm.

#### ACADEMIC APPOINTMENTS

- Professor, Electrical Engineering

#### PROGRAM AFFILIATIONS

- Stanford SystemX Alliance

#### PROFESSIONAL EDUCATION

- ScD, MIT (1990)

#### LINKS

- <http://smirc.stanford.edu/people.html>: <http://smirc.stanford.edu/people.html>

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### Teaching

#### COURSES

##### 2024-25

- Advanced Circuit Techniques: EE 308 (Spr)
- High-Frequency Circuit Design Laboratory: EE 251 (Win)
- Things about Stuff: EE 14N (Aut)

##### 2023-24

- Advanced Circuit Techniques: EE 308 (Spr)
- Circuits II: EE 101B (Spr)
- High-Frequency Circuit Design Laboratory: EE 251 (Win)
- Things about Stuff: EE 14N (Aut)

##### 2022-23

- Advanced Circuit Techniques: EE 308 (Spr)
- An Intro to Making: What is EE: ENGR 40M (Aut)

- High-Frequency Circuit Design Laboratory: EE 251 (Win)
- Things about Stuff: EE 14N (Aut)

#### 2021-22

- Advanced Circuit Techniques: EE 308 (Spr)
- High-Frequency Circuit Design Laboratory: EE 251 (Win)
- Things about Stuff: EE 14N (Aut)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

West Foster, Jeongkyu Kim, Calvin Lin, Yuya Nishio, Zhechi Ye

#### Postdoctoral Faculty Sponsor

Richelle Smith

#### Doctoral Dissertation Advisor (AC)

Nicholas Vitale

#### Master's Program Advisor

Zihan Chen, Ankush Dhawan, Aiden Duncanson, Jack Givhan, Chunsheng Ji, Ashutosh Kumar, Cheyu Lin, Quentin MacFarlane, Owen Ryan, Kerry Tu, Fengrui Zuo

#### Doctoral (Program)

George Alexopoulos, West Foster, Oliver Pranis, Tejus Rao, Pumiao Yan, Yueming Zhuo

## Publications

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### PUBLICATIONS

- **Quantum Computing Gate Emulation Using CMOS Oscillatory Cellular Neural Networks** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS II-EXPRESS BRIEFS*  
Smith, R. L., Lee, T. H.  
2024; 71 (10): 4541-4545
- **Differential Edge Modulation Signaling for Low-Energy, High-Speed Wireline Communication** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*  
Smith, R. L., Hossain, M., Werner, C. W., Kahn, J. M., Lee, T. H.  
2023
- **Polychronous Oscillatory Cellular Neural Networks for Solving Graph Coloring Problems** *IEEE OPEN JOURNAL OF CIRCUITS AND SYSTEMS*  
Smith, R. L., Lee, T. H.  
2023; 4: 156-164
- **Analysis and Design of a Tetrahedral Oscillator** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS II-EXPRESS BRIEFS*  
Smith, R. L., Lee, T. H.  
2022; 69 (1): 75-79
- **Hybrid Analysis and Simulation Methodology for Noise in Active Mixers**  
Smith, R. L., Lee, T. H., IEEE  
IEEE.2022
- **Hybrid Frequency Domain Simulation Method to Speed-up Analysis of Injection Locked Oscillators**  
Smith, R. L., Lee, T. H., IEEE  
IEEE.2021: 722-726

- **Modeling of Injection Locking in Neurons for Neuromorphic and Biomedical Systems**  
Smith, R. L., Lee, T. H., IEEE  
IEEE.2021
- **An Electronically Steerable Millimeter-Wave Reflectarray for Wireless Power Delivery**  
Buckmaster, J., Lee, T. H., IEEE  
IEEE.2020
- **A Simple Linear Time-Variant Theory of Superregeneration**  
Raghunathan, A., Lee, T. H., IEEE  
IEEE.2020
- **An Electronically Steerable Millimeter-Wave Reflectarray for Wireless Power Delivery**  
Buckmaster, J., Lee, T. H., IEEE  
IEEE.2020
- **An Electronically Steerable Millimeter-Wave Reflectarray for Wireless Power Delivery**  
Buckmaster, J., Lee, T. H., IEEE  
IEEE.2020: 514-517
- **Evaluating the Microwave Performance of Epidermal Electronics with Equivalent Transmission Line Modeling**  
Chang, T., Fan, J. A., Lee, T. H., IEEE  
IEEE.2018
- **A 125 pJ/bit 5 mW 28 GHz Superregenerative Receiver with Automatic Gain Control and Energy Efficient Startup for Burst Mode IoE Applications**  
Raghunathan, A., Lee, T. H., IEEE  
IEEE.2018: 70-73
- **A Ka-Band Beamformer for Wireless Power Transfer to Body Area Networks**  
Saiz, N. D., Buckmaster, G., Lee, T. H., IEEE  
IEEE.2018: 10-12
- **A Ka-Band Beamformer for Wireless Power Transfer to Body Area Networks**  
Saiz, N. D., Buckmaster, G., Lee, T. H., IEEE  
IEEE.2018
- **Evaluating the Microwave Performance of Epidermal Electronics with Equivalent Transmission Line Modeling**  
Chang, T., Fan, J. A., Lee, T. H., IEEE  
IEEE.2018: 40-42
- **A General Strategy for Stretchable Microwave Antenna Systems using Serpentine Mesh Layouts** *ADVANCED FUNCTIONAL MATERIALS*  
Chang, T., Tanabe, Y., Wojcik, C. C., Barksdale, A. C., Doshay, S., Dong, Z., Liu, H., Zhang, M., Chen, Y., Su, Y., Lee, T. H., Ho, J. S., Fan, et al  
2017; 27 (46)
- **Characterization of Stretchable Serpentine Microwave Devices for Wearable Electronics**  
Chang, T., Wojcik, C., Su, Y., Rogers, J. A., Lee, T. H., Fan, J. A., IEEE  
IEEE.2017: 207-10
- **A Phase-Interpolation and Quadrature-Generation Method Using Parametric Energy Transfer in CMOS** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*  
Bhardwaj, K., Lee, T. H.  
2015; 62 (5): 1250-1259
- **GPS Anti-Jam: A Simple Method of Single Antenna Null-Steering for Aerial Applications**  
McMilin, E., De Lorenzo, D. S., Lee, T., Enge, P., Akos, D., Caizzone, S., Konovaltsev, A., Inst Navigat  
INST NAVIGATION.2015: 470-83
- **Terahertz CMOS Integrated Circuits** *IEEE International Symposium on Radio-Frequency Integration Technology (RFIT) - Silicon Technology Heats up for THz*

- Lee, T. H.  
IEEE.2014
- **Terahertz Electronics: The Last Frontier**  
Lee, T. H., Bez, R., Pavan, P., Meneghesso, G.  
IEEE.2014: 30-34
  - **A 0.96mW, 5.3-6.75GHz, Phase-Interpolation and Quadrature-Generation Method using Parametric Energy Transfer in 65nm CMOS**  
Bhardwaj, K., Lee, T. H., IEEE  
IEEE.2014: 2145-48
  - **Single Antenna GPS Spoof Detection that is Simple, Static, Instantaneous and Backwards Compatible for Aerial Applications**  
McMilin, E., De Lorenzo, D. S., Walter, T., Lee, T. H., Enge, P., Inst Navigat  
INST NAVIGATION.2014: 2233-42
  - **Micro Barkhausen-Kurz Oscillators for Terahertz Integrated Systems** *15th IEEE International Vacuum Electronics Conference*  
Dixit, A., Snapp, J. P., Lee, T. H.  
IEEE.2014: 69-70
  - **Terahertz Electronics: The Last Frontier** *40th European Solid-State Circuit Conference (ESSCIRC)*  
Lee, T. H.  
IEEE.2014: 30-34
  - **Terahertz Electronics: Opportunities, Challenges and Technologies**  
Lee, T., IEEE  
IEEE.2013
  - **A 3.1mW Phase-Tunable Quadrature-Generation Method for CEI 28G Short-Reach CDR in 28nm CMOS**  
Bhardwaj, K., Narayan, S., Shumarayev, S., Lee, T., IEEE  
IEEE.2013: 412-+
  - **Dark Secrets of RF Design** *IEEE Solid-State Circuits Society Singapore Chapter, Singapore*  
Lee, T.  
2012
  - **Circuit-Based Characterization of Device Noise Using Phase Noise Data** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*  
Navid, R., Lee, T. H., Dutton, R. W.  
2010; 57 (6): 1265-1272
  - **CMOS Impedance Biosensor Array with Active Tone Cancellation for Simultaneous Impedance and Nonlinearity Measurement** *International Instrumentation and Measurement Technology Conference (I2MTC)*  
Daniels, J. S., Anderson, E. P., Pourmand, N., Lee, T. H.  
IEEE.2010
  - **The Return of the Empty State: Vacuum Nanoelectronics for Terahertz Applications**  
Lee, T.  
2010
  - **A 10Gb/s NRZ Receiver with Feedforward Equalizer and Glitch-Free Phase-Frequency Detector** *35th European Solid-State Circuits Conference (ESSCIRC 2009)*  
Kiaei, A., Bohsali, M., Bahai, A., Lee, T. H.  
IEEE.2009: 373-376
  - **When Silicon Valley was 'Arc Alley**  
Lee, T.  
2009
  - **European Solid-State Circuits Conference, Athens, Greece**  
Kiaei, A., Bohsali, M., Bahai, A., Lee, T., H.  
2009

- **Crosstalk in Integrated Microarrays With Current Sensing** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*  
Anderson, E. P., Daniels, J. S., Pourmand, N., Lee, T. H.  
2008; 55 (11): 3756-3762
- **High-speed optical beam-steering based on phase-arrayed waveguides** *52nd International Conference on Electron, Ion and Photon Beam Technology and Nanofabrication*  
Jarrahi, M., Fabian, R., Pease, W., Miller, D. A., Lee, T. H.  
A V S AMER INST PHYSICS.2008: 2124–26
- **Optical spatial quantization for higher performance analog-to-digital conversion** *IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES*  
Jarrahi, M., Fabian, R., Pease, W., Miller, D. A., Lee, T. H.  
2008; 56 (9): 2143-2150
- **Spatial Quantized Analog-to-Digital Conversion Based on Optical Beam-Steering** *JOURNAL OF LIGHTWAVE TECHNOLOGY*  
Jarrahi, M., Pease, R. F., Lee, T. H.  
2008; 26 (13-16): 2219-2226
- **Wideband, low driving voltage traveling-wave Mach-Zehnder modulator for RF photonics** *IEEE PHOTONICS TECHNOLOGY LETTERS*  
Jarrahi, M., Lee, T. H., Miller, D. A.  
2008; 20 (5-8): 517-519
- **A system for multiplexed direct electrical detection of DNA synthesis** *SENSORS AND ACTUATORS B-CHEMICAL*  
Anderson, E. P., Daniels, J. S., Yu, H., Karhanek, M., Lee, T. H., Davis, R. W., Pourmand, N.  
2008; 129 (1): 79-86
- **A System for Multiplexed Direct Electrical Detection of DNA Synthesis.** *Sensors and actuators. B, Chemical*  
Anderson, E. P., Daniels, J. S., Yu, H., Karhanek, M., Lee, T. H., Davis, R. W., Pourmand, N.  
2008; 129 (1): 79-86
- **Optical switching based on high-speed phased array optical beam steering** *APPLIED PHYSICS LETTERS*  
Jarrahi, M., Fabian, R., Pease, W., Miller, D. A., Lee, T. H.  
2008; 92 (1)
- **Monolithic integration of GaAs/AlGaAs phase modulator and photodetector for RF photonics** *Conference on Optical Fiber Communications/ National Fiber Optic Engineers Conference*  
Jarrahi, M., Miller, D. A., Lee, T. H.  
OPTICAL SOC AMERICA.2008: 106–108
- **Monolithic integration of GaAs/AlGaAs phase modulator and photodetector for RF photonics**  
Jarrahi, M., Miller, D., A. B., Lee, T., H.  
2008
- **A System for Multiplexed Direct Electrical Detection of DNA Synthesis,** *Sensors & Actuators*  
Anderson, E., P., Daniels, J., S., Yu, H., Karhanek, M., Lee, T., H., Davis, R., W.  
2008; B 129: 79–86
- **The Future of Wireless Technology in the Fourth age – The Internet of Things**  
Lee, T.  
2008
- **Simultaneous Measurement of Nonlinearity and Electrochemical Impedance for Protein Sensing Using Two-Tone Excitation**  
Daniels, J., S., Anderson, E., Lee, T., H., Pourmand, N.  
2008
- **Optical switching based on highspeed phased-array optical beam steering** *Applied Physics Letters*  
Jarrahi, M., Pease, R., F. W., Miller, D., A. B., Lee, T., H.  
2008; 92
- **High-speed optical beam-steering based on phased arrayed waveguides**

- Jarrahi, M., Pease, R., F. W., Miller, D., A. B., Lee, T., H.  
2008
- **A Label-free CMOS DNA Microarray based on Charge Sensing**  
Anderson, E., P., Daniels, J., S., Yu, H., Pourmand, N., Lee, T., H.  
2008
  - **RFIC Design & Implementation: An Introduction Plus** *IEEE short course, Singapore local Solid-State Circuits Society chapter, Singapore*  
Lee, T.  
2008
  - **A Low-verhead Fault Tolerance Scheme for TSV-based 3D Network on Chip Links**  
Loi, I., Mitra, S., Lee, T., H., Fujita, S., Benini, L.  
2008
  - **High-Power Tunable Terahertz Generation based on Photoconductive Antenna Arrays**  
Jarrahi, M., Danielson, J., Lee, T., H.  
2008
  - **Simultaneous Measurement of Nonlinearity and Electrochemical Impedance for Protein Sensing Using Two-Tone Excitation** *30th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*  
Daniels, J. S., Anderson, E. P., Lee, T. H., Pounnand, N.  
IEEE.2008: 5753–5756
  - **High-Power Tunable Terahertz Generation based on Photoconductive Antenna Arrays** *2008 IEEE MTT-S International Microwave Symposium Digest*  
Jarrahi, M., Lee, T. H.  
IEEE.2008: 390–393
  - **3-D nanoarchitectures with carbon nanotube mechanical switches for future on-chip network beyond CMOS architecture** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS I-REGULAR PAPERS*  
Fujita, S., Nomura, K., Abe, K., Lee, T. H.  
2007; 54 (11): 2472-2479
  - **Prospect of Ballistic CNFET in High Performance Applications: Modeling and Analysis** *ACM JOURNAL ON EMERGING TECHNOLOGIES IN COMPUTING SYSTEMS*  
Paul, B. C., Fujita, S., Okajima, M., Lee, T.  
2007; 3 (3)
  - **"A general theory of phase noise in electrical oscillators" - Response** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*  
Hajimiri, A., Lee, T. H.  
2007; 42 (10): 2315-2315
  - **Impact of a process variation on nanowire and nanotube device performance** *IEEE TRANSACTIONS ON ELECTRON DEVICES*  
Paul, B. C., Fujita, S., Okajima, M., Lee, T. H., Wong, H. P., Nishi, Y.  
2007; 54 (9): 2369-2376
  - **An analytical compact circuit model for nanowire FET** *IEEE TRANSACTIONS ON ELECTRON DEVICES*  
Paul, B. C., Tu, R., Fujita, S., Okajima, M., Lee, T. H., Nishi, Y.  
2007; 54 (7): 1637-1644
  - **High-frequency noise in nanoscale metal oxide semiconductor field effect transistors** *JOURNAL OF APPLIED PHYSICS*  
Navid, R., Jungemann, C., Lee, T. H., Dutton, R. W.  
2007; 101 (12)
  - **Optical Spatially Quantized High Performance Analog-to-digital Conversion** *Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference*  
Jarrahi, M., Miller, D. A., Pease, R. F., Lee, T. H.  
IEEE.2007: 987–988
  - **A circuit-based noise parameter extraction technique for MOSFETs**

- 
- Navid, R., Lee, T. H., Dutton, R. W., IEEE  
IEEE.2007: 3347-+
- **A 10Gb/s Equalizer with Decision Feedback for High Speed Serial Links**  
Kiaei, A., Matinpour, B., Bahai, A., Lee, T., H.  
2007
  - **The History of the Integrated Circuit: A Random Walk**  
Lee, T.  
2007
  - **Engineering Perspectives on Alternative Energy**  
Lee, T.  
2007
  - **From Oxymoron to Mainstream: The Evolution and Future of RF CMOS**  
Lee, T., H.  
2007
  - **Optical Spatially Quantized High Performance Analog-to-digital Conversion**  
Jarrahi, M., Miller, D., A. B., Fabian, R., Pease, W., Lee, T., H.  
2007
  - **RFID: Status, Promise and Challenges**  
Lee, T.  
2007
  - **Oscillator Phase Noise** *Santa Clara Valley IEEE Solid State Circuits Society (SSCS) Chapter Program, RFIC Design Short Course, Santa Clara, CA*  
Lee, T.  
2007
  - **Phase Noise in Oscillators**  
Lee, T.  
2007
  - **3D Nanoarchitectures with Carbon Nanotube Mechanical Switches for Future On-Chip Network Beyond CMOS Architecture** *IEEE TCA S-I Special Issue: Nanoarchitecture*  
Fujita, S., Nomura, K., Abe, K., Lee, T., H.  
2007
  - **Traveling wave spatial quantized analog-to-digital conversion** *IEEE/MTT-S International Microwave Symposium*  
Jarrahi, M., Pease, R. F., Lee, T. H.  
IEEE.2007: 225-228
  - **A 10Gb/s equalizer with decision feedback for high speed serial links** *IEEE Custom Integrated Circuits Conference*  
Kiaei, A., Matinpour, B., Bahai, A., Lee, T. H.  
IEEE.2007: 285-288
  - **From oxymoron to mainstream: The evolution and future of RF CMOS** *IEEE International Workshop on Radio-Frequency Integration Technology*  
Lee, T. H.  
IEEE.2007: 1-6
  - **High-voltage-tolerant I/O circuit design for USB 2.0-compliant applications** *IEEE Custom Integrated Circuits Conference*  
Kim, M., Icking, H., Gossner, H., Lee, T. H.  
IEEE.2007: 491-494
  - **Ordered and chaotic electrical solitons: Communication perspectives** *IEEE COMMUNICATIONS MAGAZINE*  
Ham, D., Li, X., Denenberg, S. A., Lee, T. H., Ricketts, D. S.  
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- **A programmable 0.18- $\mu$ m CMOS electrochemical sensor microarray for biomolecular detection** *IEEE SENSORS JOURNAL*  
Hassibi, A., Lee, T. H.  
2006; 6 (6): 1380-1388
- **A 1.5-v, 1.5-GHz CMOS low noise amplifier (vol 40, pg 1397, 2005)** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*  
Shaeffer, D. K., Lee, T. H.  
2006; 41 (10): 2359-2359
- **Impact of geometry-dependent parasitic capacitances on the performance of CNFET circuits** *IEEE ELECTRON DEVICE LETTERS*  
Paul, B. C., Fujita, S., Okajima, M., Lee, T.  
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- **Direct electrical detection of DNA synthesis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Pourmand, N., Karhanek, M., Persson, H. H., Webb, C. D., Lee, T. H., Zahradnikova, A., Davis, R. W.  
2006; 103 (17): 6466-6470
- **Device physics - Electrical solitons come of age** *NATURE*  
Lee, T. H.  
2006; 440 (7080): 36-37
- **Modeling and analysis of circuit performance of ballistic CNFET** *43rd Design Automation Conference*  
Paul, B. C., Fujita, S., Okajima, M., Lee, T.  
ASSOC COMPUTING MACHINERY.2006: 717-722
- **The Past and Future of the Integrated Circuit**  
Lee, T.  
2006
- **A Programmable 0.18- $\mu$ m CMOS Electrochemical Sensor Microarray for Biomolecular Detection** *IEEE Sensors Journal*  
Hassibi, A., Lee, T., H.  
2006; 6-6: 1380-1388
- **Candidate THz Sources: The History and Future of Velocity-Modulated Devices** *Photonics West, San Jose, CA*  
Lee, T.  
2006
- **RF ID: Promise and Challenges**  
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2006
- **Novel architecture based on floating gate CNT-NEMS switches and its application to 3D on-chip bus beyond CMOS architecture**  
Fujita, S., Nomura, K., Abe, K., Lee, T., H.  
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- **3D on-chip networking technology based on post-Silicon devices for Future Network on Chip**  
Fujita, S., Nomura, K., Abe, K., Lee, T., H.  
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- **Coupled Inverter Ring I/Q Oscillator for Low Power Frequency Synthesis**  
Xu, J., Verma, S., Lee, T., H.  
2006
- **Ordered and Chaotic Electrical Solitons: Communication Perspectives,** *IEEE Communications Magazine*  
Ham, D., Li, X., Denenberg, S., A., Lee, T., H., Ricketts, D., S.  
2006; 44 (12): 126-135
- **Device Physics: Electrical Solitons Come of Age** *Nature*  
Lee, T.  
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- **Things about stuff MESA Community Colleges Statewide Day, Noe Lozano**  
Lee, T.  
2006
- **Candidate THz sources: the history and future (?) of velocity-modulated devices** *Conference on Terahertz and Gigahertz Electronics and Photonics V*  
Lee, T. H.  
SPIE-INT SOC OPTICAL ENGINEERING.2006
- **3D on-chip networking technology based on post-silicon devices for future networks-on-chip.** *1st International Conference on Nano-Networks and Workshops*  
Fujita, S., Nomura, K., Abe, K., Lee, T. H.  
IEEE.2006: 105–109
- **A 17-mW 0.66-mm(2) direct-conversion receiver for 1-Mb/s cable replacement** *IEEE International Solid-State Circuits Conference (ISSCC 2005)*  
Verma, S., Xu, J. F., Hamada, M., Lee, T. H.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2005: 2547–54
- **Monolithic integrated millimeter-wave IMPATT transmitter in standard CMOS technology** *IEEE MTT-S International Microwave Symposium*  
Al-Attar, T., Lee, T. H.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2005: 3557–61
- **Comprehensive study of noise processes in electrode electrolyte interfaces (vol 96, pg 1074, 2004)** *JOURNAL OF APPLIED PHYSICS*  
Hassibi, A., Navid, R., DUTTON, R. W., Lee, T. H.  
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- **Bioluminescence regenerative cycle (BRC) system: Theoretical considerations for nucleic acid quantification assays** *BIOPHYSICAL CHEMISTRY*  
Hassibi, A., Contag, C., Vlad, M. O., Hafezi, M., Lee, T. H., Davis, R. W., Pourmand, N.  
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- **A 1.5-V, 1.5-GHz CMOS low noise amplifier (vol 32, pg 745, 1997)** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*  
Shaeffer, D. K., Lee, T. H.  
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- **Biological shot-noise and quantum-limited signal-to-noise ratio in affinity-based biosensors** *JOURNAL OF APPLIED PHYSICS*  
Hassibi, A., Zahedi, S., Navid, R., DUTTON, R. W., Lee, T. H.  
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- **An analytical formulation of phase noise of signals with Gaussian-distributed jitter** *IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS II- EXPRESS BRIEFS*  
Navid, R., Lee, T. H., DUTTON, R. W.  
2005; 52 (3): 149-153
- **Minimum achievable phase noise of RC oscillators** *IEEE JOURNAL OF SOLID-STATE CIRCUITS*  
Navid, R., Lee, T. H., DUTTON, R. W.  
2005; 40 (3): 630-637
- **A high dynamic range programmable CMOS front-end filter with a tuning range from 1850 to 2400 MHz** *21st NORCHIP Conference*  
Christensen, K. T., Lee, T. H., Bruun, E.  
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- **A Programmable Electrochemical Biosensor Array in 0.18 $\mu$ m Standard CMOS**  
Hassibi, A., Lee, T.  
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- **Biological Shot-noise and Quantum-Limited SNR in Affinity-Based Biosensor** *Journal of Applied Physics*  
Hassibi, A., Zahedi, S., Navid, R., Dutton, R., W., Lee, T., H.  
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- **A 17.1mW, 0.66mm<sup>2</sup>, Direct Conversion Receiver for 1Mb/s Cable Replacement**  
Verma, S., Xu, J., Hamada, M., Lee, T., H.  
2005
- **A 77GHz Monolithic IMPATT Transmitter in Standard CMOS Technology**  
Al-Attar, T., Hassibi, A., Lee, T., H.  
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- **A Constant-Frequency Method for Improving Light-Load Efficiency in Synchronous Buck Converters** *IEEE Power Electronics Letters*  
Mulligan, M., D., Broach, B., Lee, T., H.  
2005; 3: 24-29
- **First-Hand Tales of Successful Entrepreneurs** *MIT Club Semiconductor Program*  
Lee, T.  
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- **Comprehensive study of noise processes in electrode electrolyte interfaces** *JOURNAL OF APPLIED PHYSICS*  
Hassibi, A., Navid, R., DUTTON, R. W., Lee, T. H.  
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- **A multiply-by-3 coupled-ring oscillator for low-power frequency synthesis** *Symposium on VLSI Circuits*  
Verma, S., Xu, J. F., Lee, T. H.  
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- **High Dynamic Range Programmable CMOS Front-End Filter with a Tuning Range from 1850 to 2400 Mhz** *Analog Integrated Circuits and Signal Processing*  
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- **Effects of scaling on the SNR and speed of biosensors.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*  
Hassibi, A., Lee, T. H., Navid, R., Dutton, R. W., Zahedi, S.  
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- **Maximum a Posteriori (MAP) Estimator for Polymerase Chain Reaction (PCR) Processes**  
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- **Effects of Scaling on the SNR and Speed of Biosensors**  
Hassibi, A., Lee, T., H., Navid, R., Dutton, R., W., Zahedi, S.  
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- **Feedback Linearization of RF Power Amplifiers**  
Dawson, J., Lee, T.  
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- **Planar Microwave Engineering**  
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- **Novel Functional Logic Circuits Based on 3D Emerging Memory Cells** *3-D Architectures for Semiconductor Integration and Packaging – Understanding the Impact on Materials, Processes, and Markets, Burlingame, CA*  
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- **Lateral IMPATT Diodes in Standard CMOS Technology** *International Electron Devices Meeting Technical Digest, San Francisco, CA*  
Al-Attar, T., Mulligan, M., D., Lee, T., H.  
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- **Close-in Phase Noise in Electrical Oscillators**

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- Navid, R., Jungemann, C., Lee, T., H., Dutton, R., W.  
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- **A Comprehensive Study of Noise Processes in Electrode-electrolyte Interfaces** *Journal of Applied Physics*  
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2004; 96: 1074-1082
  - **Wireless Transceiver Building Blocks** *Stanford Engineering & Science Institute short course*  
Lee, T.  
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