

CURRICULUM VITAE

TATSUO ITOH

**Professor of Electrical Engineering
Northrop Grumman Endowed Chair**

DATE AND PLACE OF BIRTH:

May 5, 1940, Tokyo, Japan

EDUCATION:

Yokohama National University,	EE, B.S. 1964
	EE, M.S. 1966
University of Illinois, Urbana-Champaign,	EE, Ph.D. 1969

CURRENT AND PREVIOUS POSITIONS:

University of California, Los Angeles

Professor and TRW Endowed Chair, January 1, 1991 to 2003

Professor and Northrop Grumman Endowed Chair 2003 to date

University of Texas

Hayden Head Professor, September 1983 to Dec. 31, 1990

Director, Electrical Engineering Research Laboratory, Sept. 1984 to Dec. 1990

Associate Chairman for Research and Planning,

Dept. of Electrical and Computer Engineering, 1984-1990

Professor, September 1981 to Dec. 31, 1990

Associate Professor, July 1978 - August 1981

University of Kentucky

Associate Professor, August 1977 - June 1978

Stanford Research Institute

Senior Research Engineer, April 1976 - August 1977

University of Illinois

Senior Research Engineer, August 1974 - April 1976

Research Assistant Professor, September 1971 - August 1974

Research Associate, March 1969 - August 1971

Tamagawa University (Tokyo)

Teaching Assistant, April 1966 - August 1966

CONSULTING:

AEG-Telefunken, Ulm, West Germany, 1979
Selenia, s.p.A., Rome, Italy, 1979
Texas Instruments Equipment Group, Dallas, Texas, 1980
Institute for Future Technology, Tokyo, Japan, 1982
Georgia Institute of Technology, Engineering Experiment Station, Atlanta, 1981
Marconi Electronics Devices, Lincoln, England, 1981
Hughes Aircraft Company, Torrance, CA, 1980 to 1994
Teledyne Microelectronics, Los Angeles, CA 1984
Superconductor Technologies, Inc., Santa Barbara, CA. 1989 to 1990
David Sarnoff Research Center, NJ, 1992
Hughes Space and Communication, El Segundo, CA 1995 to 1996
Daimler-Benz AG, Stuttgart, Germany, 1997
Matsushita Electric, Kawasaki, Japan, 1997
Expert Witness, 2006

HONORS AND AWARDS:

University of Illinois College of Engineering Alumni Award for Distinguished Service, 2012
IEEE Microwave Career Award, 2011
European Microwave Association Outstanding Career Award, 2009
Member of National Academy of Engineering, 2003
Distinguished Microwave Educator Award, IEEE MTT-S, 2000
Millennium Medal, IEEE, 2000
IEEE Distinguished Microwave Lecturer, 2004 - 06
Shida Rinzaburo Award, Ministry of Post and Telecommunications, Japan, 1998
Japan Microwave Prize, 1998
Honorary Life Member, IEEE Microwave Theory and Techniques Society, 1994
Fellow, IEEE, 1982
Life Fellow, IEEE, 2006
Billy and Claude Hocott Distinguished Centennial Engineering Research Award, University of Texas, 1988
Distinguished Alumnus Award, University of Illinois, 1990
Fellow, Center for Advanced Study, Univ. of Illinois, 1972-73
Arthur J. Schmidt Scholar, National Electronics Conference, 1973
Listed in Who's Who in Technology Today, 1979 to date
Listed in World's Researchers, 1980 to date
Listed in Who's Who in America
Listed in American Men and Women of Science, 1981 to date
Listed in Men of Achievement, 1988 to date
Listed in 5,000 Personalities of the World, 1989 to date

Listed in the International Directory of Distinguished Leadership, 1989 to date
Listed in Who's Who in Electromagnetics, 1989, 1990
Engineering Foundation Awards, Univ. of Texas, 1980-1981
U.S. Delegate to NATO Symposium on Millimeter-Wave Propagation and Circuits, 1978
U.S. Delegate and National Academy of Science's National Research Council Representative to the General Assembly of International Scientific Radio Union, 1981, 1984, 1987, 1990, 1993
Honorary Visiting Professorship, Nanjing Institute of Technology, 1985
United Nations' International Telecommunication Union Expert for Telebras Research Center, Brazil, 1985
Invited to European Space Agency Workshop on Radiometer by IEC, Madrid, Spain, 1985
Guest Professor, National Defense Academy, Japan, 1991
IEEE Australian Council Distinguished Lecturer, 1992
Visiting Professor, University of Leeds, United Kingdom, 1994 - 2000
Visiting Professor, Beijing University of Aeronautics and Astronautics, China, 1995 - 1996.
Distinguished Research Chair Professor, National Taiwan University, 2009- 2012.

MEMBERSHIPS IN PROFESSIONAL AND HONORARY SOCIETIES:

IEEE, Life Fellow
Institute of Electronics and Communication Engineers of Japan, member
URSI (International Scientific Radio Union) Commission B and D, member

PROFESSIONAL SOCIETY AND MAJOR GOVERNMENTAL COMMITTEES:

IEEE Division IV
Representative to TAB Periodicals Council and PUB Board, 1992 to 1993

IEEE Microwave Theory and Techniques Society
Chairman, Past President Council, 1994 to 96
President, 1990
Vice President, 1989
Editor, IEEE Transactions on Microwave Theory and Techniques, July 1982-85
Editor-in-Chief, IEEE Microwave and Guided Wave Letters, 1990 to 1994
Chairman, Publications and Standards Activities, 1986-88
Administrative Committee, January 1982 to date
Chairman, Technical Committee on Microwave Field Theory,
1979-88, Member 1988 to date
Standard Committee on Planar Transmission Lines 1982-1986
Publications Evaluation Committee, 1982 to 1987
MTT Representative to URSI, 1984-87, 2006-date
Fellow Selection Committee, 1984 to 1987

Editorial Board, 1972 to date
Guest Editor, IEEE Transactions on Microwave Theory and
Techniques
(Special Issue on Open Guided Wave Structures) September 1981,
(Special Issue on Computer Aided Design) February 1988
(Special Issue on Metamaterial Structures, Phenomena and Applications) April 2005

Technical Program Committee, IEEE MTT-S International
Microwave Symposium, 1977 to date
Technical Program Committee Co-chair, IEEE MTT-S International Microwave
Symposium, Dallas, TX, 1990.
Technical Program Committee Chair, IEEE MTT-S International Microwave
Symposium, Honolulu, HI, 2007.
Steering Committee, 1982 IEEE MTT-S International Microwave
Symposium, Dallas, Texas, June 1982
Session Chairman and Session Organizer, IEEE MTT-S Interna-
tional Microwave Symposium, 1977 to date
Technical Program Committee, IEEE Microwave and Millimeter-
wave Monolithic Circuits Symposium, 1983
Steering Committee, International Conference on Infrared
and Millimeter Waves, 1979 to 1990
Workshop organizer, IEEE MTT-S International Microwave Symposia,
1984 to 1999

IEEE Solid State Circuit Council
Panel Member, International Solid State Circuit Conference,
Feb. 1978, Feb. 1981

IEEE Antennas and Propagation Society
Technical Program Committee, IEEE AP-S Symposium, Frequently 1981 to date
Technical Review for IEEE Transactions on Antennas and Propagation, 1978 to
date

IEEE Electromagnetic Compatibility
Technical Reviewer for IEEE Transactions on Electromagnetic
Compatibility, 1988 to date

IEEE Lasers and Electro-Optics Society
Technical Committee, 1991 Topical Meeting of Optical Millimeter-Wave
Interactions: Measurement, Generation, Transmission and Control, July
1991

IEEE Benelux Section
Program Commission, CompEuro'92, May 1992, Hague, The Netherlands

Institution of Electrical Engineers (London)
Technical Reviewer for IEE Electronics Letters 1977 to date
Technical Reviewer for IEE Transactions H (Microwaves,
Optics and Antennas), 1978 to date
Organizing Committee, International Conference on Computation in
Electromagnetics, November 1991, London

International Scientific Radio Union
Chairman, Commission D, 1993 to 1996
Vice Chairman, Commission D, 1990 to 1993
Chairman, Commission D, USNC, 1988 to 1990
Technical Activities Committee, Commission B, USNC, 1982
Session Chairman, International Symposium on Electromagnetic
Theory, Munich, West Germany, August 1980
Chairman, Publicity Committee, International Symposium on Signals, Systems
and Electronics, (ISSSE'92), September 1-4, 1992, Paris, France
Vice Chairman, Steering Committee, International Symposium on Signals,
Systems and Electronics (ISSSE'95), Oct. 25-27, 1995, San Francisco, CA

U.S. Government

Technical Reviewer for National Science Foundation
Technical Reviewer for National Research Council
Technical Reviewer for U.S. Army Research Office
Session Chairman, Army Research Office Workshop on Modern
Millimeter Wave Systems, Estes Park, CO, October 1980
Panel Member, Army Research Office Workshop on Short
Millimeter Wave Nonreciprocal Material and Devices, Research Triangle
Park, NC, November 1981.
Panel Member, Army Research Office Workshop on Solid State
Amplification Schemes for Electromagnetic Waves in MMW/SMMW
Region, May 1991
Army Research Office Strategic Planning Workshops, 1989, 1992, 1995, 1998,
2004
Army Research Office Board of Visitors, 2012
National Academy of Science, Committee for Army Basic Research, 1984 -88
National Academy of Science, NRC Panel for Efficient Use of Spectrum, 1994-96
External Evaluator, Naval Research Laboratory 2004, 2006
External Evaluator, NIST, 2007, 2009
National Academy of Engineering Peer Committee, 2006-08

Foreign Government

Adjunct Research Officer, Communications Research Laboratory,
Ministry of Post and Telecommunication, Japan, 1994 to 1999
German Research Council, 2007

Others

Advisory Board of Editors, International Journal of Infrared and Millimeter Waves, 1980 to 2000

Editor, Electronics and Communications in Japan , 1982 to 2009

Associate Editor, Electromagnetics, 1983 to 1990

Editorial Board, Asia-Pacific Engineering Journal, 1990 to 1994

Editorial Board, Microwave and Optical Technology Letters, 1988 to 1991

UNIVERSITY OF TEXAS COMMITTEES:

Department

Budget Council	1981 to 1990
Industrial Liaison Committee, Chairman	1981 to 1984
Strategic Goals Committee	1982 to 1990
MO&E Committee	1982 to 1983
VLSI Committee	1982 to 1983
Microelectronics Committee	1983 to 1984
Undergraduate Curriculum Committee	1981 to 1983
Optics Curriculum Committee	1981 to 1984
Field and Waves Area Committee	1978 to 1990
Chairman	1978 to 1983
Graduate Studies Committee	1978 to 1990
Library Committee	1982 to 1983
Catalog Committee	1982
Editor, EE Newsletter	1982 to 1990
Program Committee,	1982 to 1990
Annual Research Review	1983 to 1990
Chairman, Program Committee,	
Annual Research Review	1983

College

Committee on Foreign Student Enrollment	1981
Library Committee	1982 to 1983
Ad Hoc Committee on Faculty Salary Review	1983 to 1984
Internal Review Committee for Hocott Award	1989 to 1990

University

University UCAR Committee	1988 to 1990
University Project Bluebonnet	1989 to 1990

Mitre/UT System Over the Horizon Radar
Technical Com. 1989 to 1990

Community Activities

Faculty Advisor, University of Texas Japanese
Student Association 1980 to 1981

UCLA COMMITTEES:

Department

Tenure Review Committee, Chair, 1994-96, 2001-2004

Curriculum Committee, 1991 to 2004

Academic Planning and Faculty Recruiting Committee, Chair 1993 -2004

Advisory Committee, Center for High Frequency Electronic

Electromagnetics Area Committee, Chairman 1991 to 1994, 1998-date

UCLA Research Symposium, Chairman, 1992

Adhoc Committee for Graduate Major, Chair, 1994 to 1996

School of Engineering and Applied Science

Endowed Chair Search Committee Chairman and Member, 1991 to 2007

University

Adhoc Committee for Appointment and Promotion, occasional

PATENTS:

1. Waveguide having strip dielectric structure, U.S. Patent 4028643.
2. Quasi-optical polarization duplexed balanced mixer, U.S. Patent 4509209 (with K. Stephan)
3. Crosstie overlay slow-wave structure and components made thereof for Monolithic integrated circuits and optical modulators, U.S. Patent 4,914,407
4. Microwave and Millimeter Wave Noncontact ID System, U.S. Patent 5,525,993 (with C. Pobanz)
5. Highly Efficient, Ultrafast Optical-to-Electrical Converter, U.S. Patent 5,572,014 (with M. C. Wu)
6. Low Profile Cavity Backed Slot Antenna, U.S. Patent 6,518,930
7. Composite Right/Left Handed Coupler, U.S. Patent 7,508,283)
8. Zeroth Order Resonator, U.S. Patent 7,330,090, 7,398,211
9. Metamaterial Based Small Antennas, U.S. Patent 7,446,712
10. Metamaterial Based Power Combiner, U.S. Patent 7,482,893

Ph.D. SUPERVISIONS COMPLETED:

UNIVERSITY OF TEXAS

Y. C. Shih, August	1982
J. Rivera, December	1982
K. D. Stephan, May	1983
Y. Fukuoka, May	1984
S. W. Yun, May	1984
N. Camilleri, May	1985
N. U. Song, May	1986
C. Tzuang, December	1986
Q. Zhang, May	1987
B. Young, December	1987
V. Hwang, May	1988
T.-H. Wang, May	1988
S. El-Ghazaly, May	1988
S. Nam, May	1989
J. Birkland, August	1989
H.-Y. Lee, December	1989
C.-Y. Chang, May	1990
Y.-D. Lin, May	1990
J. McLean, May	1990
A. Mortazawi, August	1990
C. W. Kuo, August	1991
K.-S. Kong, August	1991
A. V. Filippas,(co-supervision)	1993

UCLA

S. Kawasaki	March, 1993
T-W. Huang	December, 1993
B. T. Toland	March, 1994
A. Tran	June, 1994
J. Lin	March, 1994
S. Basu	December, 1994
Y. Liu	March, 1995
C.-Y. Lee	June, 1995
O. Boric-Lubecker	June, 1995
P. MacDonald	June, 1995
J. Pekarek	March, 1996
S. T. Chew	September, 1996
C.-N. Kuo	September, 1997
D. S. Koh	December, 1997
C. W. Pobanz	December, 1997
M. Chen	June, 1998
A. Basu	September, 1998

A. Perkons	September, 1998
V. Radisic	December, 1998
K.-P. Ma	March, 1999
M. D. DuFault	December, 1999
F.-R. Yang	June, 2000
W. Deal	June, 2000
J. Kim	June, 2000
N. Kaneda	September, 2000
S.-H. Chang	December, 2000
S. Lin	December, 2001
H.-P. Tsai	March, 2002
C.-C. Chang	June, 2002
Y. Miyamoto	June, 2002
T. Nishino	June, 2002
M. Sironen	September, 2002
J. Sor	September, 2002
J. Fredrick	September, 2002
C. Hang	December, 2002
S. Jeon	March, 2003
T. Nishio	September, 2003
M. DeVincentis	December, 2003
K. Leong	March, 2004
Y. Chung	March, 2004
J. Park	December, 2004
I.-H. Lin	December, 2004
S. Lim	2006
C.-J. Lee	2007
C. Allen	2007
D. Goshi	2007
A. Lai	2007
A. Yu	2010
P. Chi	2010
R. Hashemi	2011
Y. Dong	2012
S. Sun	2013
P. Hon (joint supervision)	2013

M.S. SUPERVISIONS COMPLETED

UNIVERSITY OF TEXAS

D. C. Zimmerman December 1979

J. Rivera, May 1980

N. Camilleri, May	1982
S. Cook, December	1982
Q. Zhang, May	1984
T. S. Chu, May	1985
T. Mu, Dec.	1985
V. Hwang, May	1986
Y.-D. Lin, May	1987
W. X. Huang, May	1987
A. Mortazawi, Dec.	1988
S. S. Chang, Dec.	1988
K.-S. Kong, Dec.	1988
A. V. Filippas, May	1989
C. W. Kuo, May	1989
B.-K. Kim, May	1991

UCLA

J. Lin	December, 1991
F.-O. Dal	December, 1992
K. Cha	September, 1993
C. W. Pobanz	December, 1993
K. Khojastegan	March, 1994
D.-C. Niu	September, 1994
T. Chang	June, 1995
M. R. Greene	June, 1995
R. J. Engelhardt	June, 1995
J. Liao	September, 1995
S. Wong	March, 1996
H. Z. Chang	June, 1996
P. G. Kinney	March, 1997
E. W. Ray, Jr.	June, 1997
W. Fu	September, 1997
W. R. Deal	March, 1998
Q. Chaudhry	June, 1998
B.-S. Ke	September, 1998
S. Y. Lee	December, 1998
Y. Miyamoto	June, 1999
R. Broas	September, 1999
S. Lin	December, 1999
Y. Hang	December, 1999
J. D. Fredrick	June, 2000
J. Sor	September, 2000
Y. Song	March, 2001
L. B. Chau	2001
K. Leong	June, 2001
W. Kim	June, 2001

D. Harvey	June, 2001
J. Park	2002
M. DeVincentis	March, 2003
I-H. Lin	June, 2003
W. Yao	September, 2003
A. Bhatt	December, 2003
C. Allen	March, 2004
S. Lim	March, 2004
D. Goshi	March, 2004
T. Fujishige	September, 2004
C.-L. Lin	December, 2004
A. Petrucelli	December, 2004
J. Bardin	March, 2005
A. Lai	March, 2005
A. Dupuy	March, 2005
M-W. Kang	June, 2005
R. Bilotta	June, 2005
N. Chopra	2005
J. Choi	2006
E. Ash	2006
P. Hon	2007
J. Sun	2007
C. T. Wu	2009
Ranjan Misra	2010

Ph.D.'s IN PROGRESS:

J. Choi
C. T. Wu
H. Lee

M.S. IN PROGRESS:

J. Tanabe
K. Dhvaj

GRANTS AND CONTRACTS:

Summary of Grants

	Federal	State	Industry	Total
UT Austin	\$2,953,893	\$1,096,624	\$389,682	\$4,440,199
UCLA	\$15,612,028	\$460,570	\$2,83,868	\$18,911,466

UNIVERSITY OF TEXAS

Quasi-optical techniques for millimeter and submillimeter wave circuits, DAAG29-79-G-00200, U.S. Army Research Office, \$99,662, July 1, 1978 - February 28, 1981.

Interface structures for millimeter-wave circuits, DAAG29-81-K-0053, U.S. Army Research Office, \$171,335, March 1, 1981 - August 31, 1984.

Studies of non-reciprocal effects in planar submillimeter to optical waveguiding structures, N00014-79-C-0553, Office of Naval Research, \$186,305, June 1, 1979 - August 31, 1984.

Millimeter-wave transmission lines study, Texas Instruments Equipment Group, \$65,573, June 1, 1979 - December 31, 1984.

Equipment Grant, University Research Institute, \$4425, September 1, 1978 - August 31, 1979.

Guided-wave devices for the far-infrared-mm wave spectrum (Co-PI: A. B. Buckman), Joint Services Electronics Program, \$207,000, April 1979 - March 1983.

Guided waves in composite structures, Joint Services Electronics Program, \$132,000, April 1982 - March 1986.

Guided wave interactions in millimeter-wave integrated circuits, U. S. Army Research Office, \$225,346, September 1, 1984 - August 31, 1987.

Pulse transmission in planar transmission structures on a semiconductor substrate, Office of Naval Research, \$91,267, September 1, 1984 - August 1986.

Printed line structures for monolithic millimeter-wave circuits, Hughes Aircraft, \$78,432, May 15, 1984 - September 30, 1987.

Millimeter wave planar circuits, Hughes Aircraft, \$10,000, August 1, 1985 - July 31, 1986.

Millimeter wave research, Martin Marietta, \$60,575, September 1, 1985 - August 31, 1987.

Millimeter wave monolithic circuits, \$11,700, NTT Electrical Communication Laboratories, October 11, 1985 - May 31, 1987.

Integrated millimeter-wave and optoelectronic components for very high speed communications applications (Co-PI), Texas Advanced Technology Research Program, \$400,000, November 1, 1985 - August 31, 1987.

Monolithic Phase Shifter Study, Air Force Office of Scientific Research, (co-PI: D.P. Neikirk) \$589,695, November 1, 1985 - October 31, 1988.

Millimeter-wave monolithic array components, Joint Service Electronics Program (Co-PI: D.P. Neikirk) \$251,000, April 1, 1986 - March 31, 1989.

Millimeter wave transmission lines, Office of Naval Research, \$91,767, September 1, 1986 - September 30, 1988.

Guided Wave Phenomena in Millimeter Wave Integrated Circuits and Components, U.S. Army Research Office, \$298,131, April 1, 1988 - March 31, 1991.

GaAs Based Millimeter-Wave Integrated Circuit Characterization and Design, CRAY Research Ins., \$45,862, January 1, 1988-December 31, 1988.

E-Plane Filter Analysis and Design, Hughes Aircraft, \$20,515, July 1, 1987-July 1, 1988.

Large Signal Modeling of MESFET, Hughes Aircraft, \$7,011, Feb. 22, 1988-May 20, 1988.

Monolithic Millimeter-Wave Integrated Circuits, Texas Higher Education Coordinating Board Advanced Technology Program, \$198,433, June 15, 1988-Aug. 31, 1989.

Computer Aided Design of Millimeter-Wave Integrated Circuits, Texas Higher Education Coordinating Board Advanced Technology Program, (Co-PI: Hao Ling) \$143,766, June 15, 1988-Aug. 31, 1989.

Picosecond Laser System for High-Speed Laser System for High-Speed Characterization of Monolithic Devices (Equipment Grant), Dept. of Defense University Research Instrumentation Program, (Co-PI's: M.C. Downer, D. P. Neikirk), \$75,303, Sept. 1, 1988-Aug. 31, 1989.

Millimeter Wave Active Guided Structures, Joint Services Electronics Program, (Co-PI: D. P. Neikirk), \$255,000 April 1, 1989-March 31, 1992.

High Temperature Superconducting Planar Circuit Structures for High Frequency Applications, Office of Naval Research, \$239,352, Oct. 1, 1988-Sept. 30, 1991.

Unrestricted Use, Honeywell, Inc., \$3,000, March 20, 1989.

Unrestricted Use, John Wiley and Sons, \$800, June 1, 1989-May 31, 1990.

Unrestricted Use, Nippon Telegraph and Telephone Corp., \$652, May 15, 1989.

Unrestricted Use, Sony Corp., \$8,000, June 1, 1989-May 31, 1990.

Quantum Well Device-Based Circuits for Millimeter Wave Communications Applications, Texas Higher Education Coordinating Board Advanced Technology Program, (Co-PI: D. P. Neikirk) \$150,000, Jan. 1, 1990-Dec. 31, 1991.

Microwave-Optical-Interaction Devices and Circuits, Texas Higher Education Coordinating Board Advanced Technology Program, (Co-PI: J. C. Campbell) \$200,000, Jan. 1, 1990-Dec. 31, 1991.

Analysis and Characterizations of Planar Transmission Structures and Components for Superconducting and Monolithic Integrated Circuits, NASA-Lewis Research Center, \$40,730, Nov. 13, 1989-Nov. 12, 1990.

Noise Measurement System (Equipment Grant), Hewlett-Packard, \$59,100, May 1990.

Research on New Configurations for Microwave and Millimeter-Wave IC's, NTT Radio Communication Systems Lab., \$10,000, July 1, 1990-June 30, 1991.

Analysis of Waveguides for Millimeter-Wave and Optical Integration Circuits, ATR Optical and Radio Communications Research Lab., \$8,462, June 1, 1990 - June 30, 1991.

UCLA

"Guided Wave Phenomena in Millimeter Wave Integrated Circuits and Components,"

Army Research Office (via Univ of Texas), DAAL03-88-K-0005,
\$193,374, January 1, 1991-December 31, 1992.

"High Temperature Superconducting Planar Circuit Structures for High Frequency Applications,"

Office of Naval Research, N00014-91-J-1651,
\$150,635, June 1, 1991-September 30, 1993.

"Analysis and Characterization of Planar Transmission Line Structures and Components for Superconducting Integrated Circuits,"

NASA Lewis Research Center, NCC3-192,
\$34,328, January 1, 1991-December 31, 1991.

"New Configurations for Microwave and Millimeter-Wave ICs,"

NTT Radio Communication Systems Laboratories,
\$34,700, January 1, 1991 - June 30, 1993.

"Analysis of Waveguides for Millimeter-Wave and Optical Integrated Circuits,"

ATR Optical and Radio Communication Laboratory,
\$58,396, January 1, 1991- June 30, 1992.

"Extension of Spectral Domain Method for Discontinuities in Monolithic Microwave and Millimeter Wave Integrated Circuits with Thick Metalization,"

Hughes (MICRO), \$40,000, July 1, 1991 - June 30, 1992.

"Analytical Circuit Modeling for Passive Monolithic Microwave and Millimeter Wave Components,"

TRW (MICRO), \$50,000, July 1, 1991-June 30, 1992.

"3-Dimensional Microwave Integrated Circuits,"

Hughes Aircraft Company, \$18,359, October 1, 1991 - September 30, 1992.

"Millimeter Wave Electronics," Air Force Office of Scientific Research,

Joint Services Electronics Program (AFOSR),
\$1,375,402 July 1, 1992 - June 30, 1995. (Joint with N. Luhmann)

"Wave interactions in active and passive microwave and millimeter wave circuits,"

Army Research Office, DAAH04-93-G-0068,
\$313,000, Feb 15, 1993-Feb 14, 1996

"Optoelectronic interactions of active integrated antennas,"

AASERT (ARO), DAAH04-93-G-0174,
\$120,000, June 1, 1993-May 31, 1996

"Analysis of electromagnetic characteristics for uniplanar structures,"

TRW (MICRO), \$42,352, July 1, 1992-December 31, 1993

"Extension of spectral domain method for 3-dimensional discontinuities in microwave integrated circuits,"

Hughes (MICRO), \$34,069, July 1, 1992-December 31, 1993,

- "Microwave and millimeter wave chip antennas,"
NEC Corporation, \$20,000, April 1, 1993-March 31, 1995
- "Frequency Scannable Leaky Wave Antennas Based on Dielectric Waveguides,"
ThermoTrex, \$179,996, October 11, 1993-August 15, 1994
- "Analysis of electromagnetic characteristics for uniplanar structures,"
TRW (MICRO), \$34,857, July 1, 1994 - June 30, 1995
- "Comprehensive Electromagnetic Simulation of Microwave Integrated Circuits,"
Hughes (MICRO), \$ 87,143, July 1, 1994 - June 30, 1995
- "Time Domain Characterization of Selected Waveguide Discontinuities,"
MAG (MICRO), \$ 15,000, July 1, 1993 - June 30, 1995,
- "Electronically and Optically Controllable Leaky Wave Antennas,"
AASERT (ARO), DAAH04-93-G-0316,
\$111,843, September 1, 1993-August 31, 1996
- "Active Excitation of 2-dimensional Quasi-Optical Circuits,"
AASERT (ARO), DAAH04-93-G-0139,
\$107,000, July 1, 1994-June 30, 1997
- "Ultrafast High Power Photodectors" (Joint with M. Wu)
Army Research Office, DAAH04-95-I-0405,
\$269,793, July 1, 1995 -June 30, 1998
- "Scanning Near-Field Optical Lithographis System," (Equipment)
DURIP (ARO), DAAH04-95-I-0029,
\$207,000, Nov. 18, 1994-Nov. 17, 1995
- "Ultrafast Streak Camera for 100 Gb/s Optical Network Testbed," (Co-Pi, M. Wu as PI)
DURIP (ARO), DAAH04-95-I-0441,
\$169,810, July 1, 1995 - June 30, 1996
- "Active Integrated Beam Steering and Switching Array with All Optical Control,"

AASERT (AFOSR), F49620-95-1-0414
\$108,255, June 1, 1995- May 31, 1998
- "International Symposium on Signals, Systems and Electronics,"
Army Research Office, DAAH04-95-I-0340,
\$5,000, August 1, 1995 - July 31, 1996

- "International Symposium on Signals, Systems and Electronics,"
Office of Naval Research, N00014-95-1-0641,
\$5,000, May 1, 1995 - April 30, 1996
- "Frequency Scannable 220 GHz Dielectric Leaky Wave Antennas,"
ThermoTrex Corporation, \$179,986, Jan. 1, 1995 - Jan.1, 1996
- "UCLA JSEP Program in Millimeter Wave Electronics,"
JSEP (AFOSR), \$1,189,110, Oct.1, 1995 – Oct. 31, 1998.
- "Comprehensive Electromagnetic Simulation of Microwave Integrated Circuits,"
Hughes (MICRO), \$62,363, July 1, 1995 - June 30, 1996
- "Analysis of Electromagnetic Characteristics for Non Leakage Coplanar Structures,"
TRW (MICRO), \$35,636, July 1, 1995 - June 30, 1996
- "Ultrafast High Power Photodetectors," (Co-PI)
ARO, \$217,939 (Co-PI \$108,919), July 15, 1995 – Dec. 31, 1997
- "Low Power/Low Noise Electronics Technologies for Mobile Wireless Communications,"
MURI (ARO), \$4,000,000, August 1, 1995 – Dec. 11, 2000
- "Study of MMIC Transitions and Interconnects,"
TRW (MAFET II), \$200,000, Nov.14, 1995-Sept.30, 1997
- "High Efficiency W-Band Power Source,"
TRW (MAFET III), \$200,000, Oct.6, 1996-Sept.30, 1998
- "Photonic Bandgap Engineering," (Co-PI)
MURI (ARO), \$3,000,000(Co-PI \$240,000), Sept. 1, 1996 – Aug.31,1999
- "RF Photonics and Devices," (Co-PI)
MURI (ONR), \$5,444,000 (Co-PI \$500,000), April 30, 1997-April 29, 2002
- "Velocity-Matched Traveling Wave Photodetectors for Photomixing of Millimeter Waves,"
Associated Universities, Inc. (National Radio Astronomy Observatory)
\$265,745, July 1, 1997 – June 30, 1999
- "GaN-Based Microwave Power Amplifiers," (Co-PI)
Army Space and Strategic Defense Command,
\$4,104,181 (C-PI, \$720,000), April 11, 1996 – April 10, 2001

- “Integrated Antennas as Contactless Connector for Wireless Systems,”
Rockwell Science Center (MICRO), \$25,000, July 1, 1997 – June 30, 1998
- “RF Front-Ends for 60 GHz Multimedia Wireless System,
SONY Electronics, Inc. (MICRO), \$30,000, July 1, 1997 – June 30, 1998
- “Comprehensive Electromagnetic Simulation of Microwave Integrated Circuits,”
HUGHES (MICRO), \$35,000, July 1, 1997 – June 30, 1998
- “Analysis of Electromagnetic Characteristics of Flip Chip Interconnects,”
TRW (MICRO), \$25,000, July 1, 1997 – June 30, 1998
- “Development of a Capstone Integrated Systems Laboratory,”
TRW Cleveland Foundation, \$40,000, 1998
- “High Efficiency Power Amplifiers Using Photonic Band-Gap Crystals,”
ARO (AASERT), \$119,307, July 1, 1997-June 30, 2000
- “Active Integrated Antenna Front-End Technology for Future Millimeter-Wave Wireless Communications,”
NSF, \$450,000, Sept. 15, 1999 – August 31, 2002
- “Reconfigurable Antennas for Multiband/Multifunction Transceiver,”
DARPA/SPAWAR, \$2,765,000, Sept. 29, 1999 – Sept, 28, 2002
- “Quantum Device Technology for Terahertz Communication Trasciever,”
DARPA/HRL, \$200,000, Oct. 1, 1999 – Sept. 30, 2002
- “RF Front-Ends for 60 GHz Multimedia Wireless System,”
SONY (MICRO), \$44,866, July 1, 1999 – June 30, 2001
- “Three-Dimensional Functional MMIC,”
TRW Foundation, #25,000, Aug. 1, 1998 – June 30, 2000
- “Integrated Antenna and Packaging Technology for Future MM-Wave Wireless Systems,”
SONY (MICRO), \$44,866, July 1, 1999 – June 30, 2001
- “Multifunctional Adaptive Radio, Radar and Sensors,”
ARO/NCSU (MURI), \$ 528,800.00, 05/01/01 – 02/28/06
- “Scalable and Reconfigurable Electromagnetic Metamaterials and Devices,”
DARPA/NAVY (MURI), \$ 500,000.00, 05/01/01 – 07/31/06
- “High Performance “Signal Processing” Antenna Array Systems for Wireless

- Communications,”
National Science Foundation, \$500,000.00, 07/01/02 – 08/31/05
- “RF Front-Ends for 60 GHz Multimedia Wireless System,”
Sony – UC MICRO, \$44,847.00, 07/01/04 - 12/31/05
- “Metamaterial Based Small Antennas,”
Qualcomm – UC DISCOVERY GRANT, \$69,294.00, 08/24/04 – 08/23/05
- “Characterization of Periodic Structures,”
Lockheed Martin Aeronautics – Palmdale, \$100,000.00, 05/01/05 – 02/24/06
- “Investigation of Millimeter Wave Electronic Scanned Array Radar,”
BAE Systems Platform Solutions / UC DISCOVERY GRANT
\$147,925.00 05/10/05 – 05/09/06
- “Novel Components for 60 GHZ RF Frontends”
Sony Corporation (UC MICRO) – \$80,268.00, 08/01/05 – 12/31/06
- “Direct Antenna Modulation for Ultra Wide Band Signal Transmission”
Army (ARO) – \$59,765.36, 08/01/05 – 10/31/07
- “Design of 94-GHz Photonic Bandgap Phased Array”
UC Lawrence Livermore National Laboratory (U.S. DOE)
\$9,942.00 12/08/05 – 12/31/06
- “Evanescent Mode LHM”
Lockheed Martin – \$60,000.00, 04/01/06 – 12/31/06
- “Development of Compact Metamaterial Antennas for Antennas for MIMO Systems”
Rayspan Corporation – \$110,000.00, 05/01/06 – 04/30/07
- “2.4 Ghz Metamaterial Miniature Antennas”
Rayspan Corporation – \$3,036.00, 06/15/06 – 06/29/06
- “Metamaterial Antennas for MIMO Applications”
Rayspan Corporation (UC MICRO) – \$58,159.00, 08/01/06 – 12/31/07
- “Novel Components for High Frequency RF Front-Ends 2006”
Sony Corporation – \$67,332.00, 08/17/06 – 12/31/07
- “Study of Compact Metamaterial Based Filters”
Panasonic Semiconductor Development Center – \$70,000.00, 09/01/06 – 08/31/07
- “KA Band Quasi-Yagi Antenna Design”
Agile Materials and Technologies – \$5,000.00, 11/01/06 – 2/28/07
- “Microwave Detection of Laser Ultrasonic for Non-Destructive Testing”
BossaNova Technologies, LLC – \$28512.00, 01/19/07 – 01/18/08
- “Enhanced Sparse Array Antennas for Millimeter Wave Applications”
MMCOMM (UC Discovery) – \$87,681.00, 02/01/07 – 01/31/08
- “Compact High-Frequency Antennas”

- Pharad, LLC – \$30,000.00, 07/31/07 – 03/06/07
- “Compact High Frequency Antennas”
Pharad – \$255,000.00, 06/01/07 – 08/31/07
- “Compact High Frequency Antennas”
Pharad – \$255,000.00, 06/01/07 – 08/31/07
- “Dual Band Mimo Antenna Module Using Miniature Directional Coupler”
Rayspan Corporation (UC Program-Micro) – \$60,374.00, 08/24/07 – 12/31/08
- “Feasibility Study of Metamaterial Structure Compatible to Cmos Process”
Sony Corporation (UC MICRO) – \$81,625.00, 08/24/07 – 12/31/08
- “Tunable Metamaterial Filters and Channelizing Antenna”
LGS Innovations LLC – \$63,000.00, 12/10/07 – 09/30/08
- “Enhanced Sparse Array Antennas for Millimeter Wave Application”
Honeywell Labs (UC DISCOVERY GRANT) – \$86,557.00, 02/01/08 – 01/31/09
- “Compact Band-Pass Filter Based on Left Handed Transmission Structures”
Panasonic (UC DISCOVERY GRANT) – \$86,557.00, 02/01/08 – 01/31/09
- “All Dielectric non-Electronic Radio Front-End (ADNERF) Technology”
DARPA ADNERF / EMPIRE – \$250,000, 03/13/08 – 12/12/09
- “Investigation on Circularly Polarized Antennas for Planar Array Applications”
Alico Systems, Inc. – \$25,000.00, 04/01/08 – 06/30/08
- “Microwave Detection of Laser Ultrasonic for non-Destructive Testing”
BOSSA NOVA TECH. LLC – \$88,333.00, 06/25/08 – 06/24/10
- “CRLH-Based integrated Leaky-Wave Antenna Distributed Amplifier Applications”
Rayspan Corp (State) – \$15,392.00, 08/15/08 – 12/31/09
- “Integrated CRLH Based Antennas with Class-F Amplifiers”
SONY (STATE) – \$51,933.00, 08/15/08 – 12/31/09
- “Compact Band-Pass Filter Based on left Handed Transmission Structures”
Panasonic (UC DISCOVERY) – \$88,017.00, 04/01/09 – 03/31/10
- “Millimeter-Wave Conformal Metamaterial Leaky Wave Antennas”
Honeywell (UC DISCOVERY) – \$88,017, 04/01/09 – 03/31/10
- “Modified Mushroom Structures for the Metamaterial Antenna Study”
NEC CORP – \$70,000.00, 08/01/09 – 03/31/10
- “Terahertz Transmission-Line Metamaterial for Quantum Cascade Lasers,”
NSF - \$229,327, 09/01/09 – 8/31/12

SUMMARY OF PUBLICATIONS

A. Books and Book Chapters	48
B. Archival Journal Publications	428
C. Reviewed Conference Publications	864