

**George I. Haddad, Fellow, IEEE; Member Ntl. Acad. Engg.**

Professor, EECS Department  
Department of Electrical Engineering and Computer Science  
UNIVERSITY OF MICHIGAN

**Role in the Center: Advisor**

**Areas of Research:** While a microwave circuit elements researcher, he will be an advisor for the Center.

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**A. PROFESSIONAL PREPARATION**

**University of Michigan,**  
**University of Michigan,**  
**University of Michigan,**

Electrical Engineering, Ph.D., 1963  
Electrical Engineering, M.S., 1958  
Electrical Engineering, B.S., 1956

**B. APPOINTMENTS**

<b>Emeritus Professor,</b> EECS Department, University of Michigan	2005-present
<b>Chairman,</b> EECS Department, University of Michigan	1991-1997
<b>Director,</b> Center for High-Frequency Microelectroelectronics,	1986-2000
<b>Professor,</b> EECS Department, University of Michigan	1969-2005
<b>Associate Professor,</b> EECS Department, University of Michigan	1965-1969
<b>Assistant Professor,</b> EECS Department, University of Michigan	1963-1965

**C. SYNERGISTIC ACTIVITIES**

He was Chair of the Department (1975-1986, 1991-1997). He also served as Director of the Electron Physics Laboratory (1969-1975), Director of the Solid-State Electronics Laboratory (1986-1991), and Director of the Center for High Frequency Microelectronics (1986-2000). His expertise is in the areas of microwave and millimeter-wave devices and integrated circuits, microwave-optical interactions, optoelectronic devices, and integrated circuits.

Dr. Haddad is a member of Eta Kappa Nu, Sigma Xi, Phi Kappa Phi, Tau Beta Pi, the American Society for Engineering Education, and the American Physical Society. He is also a member of the National Academy of Engineering. He was editor-in-chief of the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES (1968-1971) and was a member of the IEEE Microwave Theory and Techniques Society (IEEE MTT-S) Administrative Committee (1970-1976). He has also served and participated on numerous other IEEE committees and activities. He was the recipient of the Curtis W. McGraw Research Award of the American Society for Engineering Education (1970), The College of Engineering Excellence in Research Award (1985), the Distinguished Faculty Achievement Award (1986) of The University of Michigan at Ann Arbor, and the S. S. Attwood Award of the College of Engineering. He was also the recipient of the IEEE MTT-S Distinguished Service Award and the IEEE MTT-S Distinguished Educator Award (1996).

**D. RELATED PUBLICATIONS**

1. "Low Crosstalk (<-40dB) in 1.55um High Speed OEIC Photoreceiver Arrays with Novel on-chip Shielding," (with A. L. Gutierrez-Aitken, P. Bhattacharya, K. C. Syao, K. Yang and X. Zhang), Electron. Lett., vol. 32, 1706-1708, 1996.
2. "Monolithically Integrated 16-Channel 1.55um pin/HBT Photoreceiver Array with 11.5 GHz Bandwidth," (with K. C. Syao, K. Yang, S. Zhang and P. Bhattacharya), Electronics Lett., vol. 33, No. 1, 82-83, 1997.
3. "High Speed Monolithically Integrated p-i-n/HBT Photoreceivers," (with K. C. Syao, A. L. Gutierrez-Aitken, K. Yang, X. Zhang and P. Bhattacharya), IEICE Trans. Electron., vol. E80-C, No. 5, 695-702, 1997.

4. "Self-Consistent Scattering Calculation of Resonant Tunneling Diode Characteristics," (with J. P. Sun), *VLSI Design*, vol. 3, 1-4, 1997.
5. "Transfer Matrix Method for Interface Optical-Phonon Modes in Multiple-Interface Heterostructure Systems," (with S. G. Yu, W. Kim, M. A. Stroscio, G. J. Iafrate and J. P. Sun), *J. Appl. Phys.*, vol. 82, 3363-3367, 1997.
6. "Tunneling Devices and Applications in High Functionality/Speed Digital Circuits," (with P. Mazumder), *Solid-State Electronics*, vol. 41, 1515-1524, 1997.
7. "High  $f_{max}$  InP Double Heterojunction Bipolar Transistors with Chirped InGaAs/InP Superlattice Base-Collector Junction Grown by CBE," (with K. Yang and G. Munns), *IEEE Electron Dev. Lett.*, vol. 18, 553-555, 1997.
8. "Investigation of Adjacent Channel Crosstalk in Multi-channel Monolithically Integrated 1.55 $\mu$ m Photoreceiver Arrays," (with K. C. Syao, K. Yang, X. Zhang, L. Lu, L. Katehi and P. Bhattacharya), *J. Lightwave Techn.*, vol. 15, 1888, 1997.
9. "Resonant Tunneling Diodes: Models and Properties," (with J. P. Sun, P. Mazumder and J. N. Schulman), *Proceedings of the IEEE*, vol. 86, 641-661, 1998.
10. "Device Applications of Resonant Tunneling Structures," (G. I. Haddad and I. Mehdi) chapter in *Optoelectronic Materials and Device Concepts*, ed. M. Razeghi, SPIE press, November 1991.
11. "Digital Circuit Applications of Resonant-Tunneling Devices," (with P. Mazumder, S. Kulkarni, M. Bhattacharya and J. P. Sun), *Proceedings of the IEEE*, vol. 86, 664-686, 1998.
12. "Efficient Power Combining with D-Band (110-170 GHz) InP Gunn Devices in Fundamental-Mode Operation," (with H. Eisele), *IEEE Microwave and Guided Wave Lett.*, vol. MWGL-8, 24-26, 1998.
13. "Self-Consistent Scattering Calculation of Resonant Tunneling Diode Characteristics," (with J. P. Sun), *VLSI Design*, vol. 6, 83-86, 1998.
14. "Phonon Assisted Intersubband Transitions in Step Quantum Well Structures," (with H. B. Teng, J. P. Sun, M. Stroscio, S. Yu and K. W. Kim), *J. Appl. Physics.*, vol. 84, 2155-2164, 1998.
15. "Electron-Interface Phonon Interaction in Multiple Quantum Well Structures," (with J. P. Sun, H. B. Teng and M. A. Stroscio), *Semiconductor Sci. Technol.*, vol. 13, A147-A151, 1998.
16. "Two-Terminal Millimeter-Wave Sources," (with H. Eisele), *IEEE Transactions on Microwave Theory and Techniques*, vol. 46, 739-746, 1998.
17. "Intersubband Relaxation in Step Quantum Well Structures," (with J. P. Sun, H. B. Teng, M. A. Stroscio and G. J. Iafrate), *VLSI Design*, vol. 8, 289-293, 1998.
18. "An Efficient Fourier Transform Algorithm for Multitone Harmonic Balance," (with V. Borich and J. East), *IEEE Trans. on Microwave Theory and Techn.*, vol. 47, 182-188, 1999.

#### **E. RELATED PATENTS**

1. Narrow-Band w-Band-Gaap Base Transistor Structure with Dual Collect-Base Barrier Including a Graded Barrier, Patent Number 4,912,539, issued March 27, 1990.
2. Digital Logic Design Using Negative Differential Resistance Diodes and Field-Effect Transistors, U.S. Patent No. 5903170, issued May 11, 1999.