

## Development of Man Made Electronic Materials and Devices: Past and Future

**Sunday May 5<sup>th</sup> Welcome reception from 6.00pm, Bioinformatics (Main Lobby)**

**Monday May 6<sup>th</sup> Bioinformatics Building Room 105**

8.00 Breakfast

8.30 – 10.00: Introductions Mike Fiddy

Bob Wilhelm, VC; Bob Johnston, Dean of Engineering; Rich Hammond, Army Research Office; (10 min)

Ian Ferguson, Chair of Electrical and Computer Engineering (5m)

Leo Esaki, Nobel Laureate Putting Quantum Principles into Practice – Research on Tunneling and Superlattices 15m

Ray Tsu, Distinguished Prof. Vision...past, present and future 15m

Gloria Lubkin (AIP) Physics Today on Superlattice and Resonant tunneling 15m

Manijeh Razeghi (NWU) Type II Superlattices (review) 25m

10.00 – 10.30 Break

10.30 - 12.00 Chair: Mike Fiddy

Mike Fiddy (UNCC) Superlattices paved the way for metamaterials 10m

Fred Schubert (RIT) Band-edge discontinuities in semiconductor heterostructures – the fundamental building blocks of modern devices (review) 20m

Yong-hang Zhang (ASU) InAs/InAsSb type-II superlattices and their applications in lasers and photodetectors. 10m

Rui Q. Yang (UO) Interband Cascade Lasers and Relevant Devices Based on Type-II Heterostructures. 10m

Kwok Ng (SRC) Superlattice and Resonant Tunneling as Device Building Blocks 10m

### Video/Skype

- Roberto Merlin (UMich)                      The Age of Synthetic Structures: From Superlattices  
to Metamaterials (Skype) 10m
- Varayanamurti Venkatesh (Harvard)      Early days of superlattices 10m

### 12.00 to 1.00 Lunch

### 1.00 – 2.30: Chair Timir Datta

- Alex Zunger (UCB)                      Genetically engineered superlattices with target materials  
properties 25m?
- David Tsu (Ming Scientific) Ge: the good the bad and the ugly, how d-orbitals can ruin your  
material or create new opportunities 15m
- Angelo Mascarenhas (NREL)      Can Superlattices be Applied to PV Cells?                      10m
- Marc Cahay (UC)                      Spin polarization in side gated single and dual quantum point  
contacts with lateral spin orbit coupling 10m
- Zhe Chuang Feng (NTU) + Devki N. Talwar (IUP) Optical and theoretical investigation on  
InAs/GaSb Superlattices 10m
- Zhe Chuang Feng (NTU) Visible light from Si-based materials 5m
- Devki N. Talwar (IUP) Novel strained layer superlattices for long wavelength IR detectors 5m

### 2.30 – 3.00 Break

### 3.00 – 4.30: Chair David Tsu

- Mark Reed (Yale)                      The Ultimate Quantum Dot: Molecular Transistors 10m
- Yong Zhang (UNCC)                      Inorganic-organic hybrid SL 10m
- Quiyi Ye (UA)                      From Si-Quantum Dots to 14nm CMOS technology. 10m
- John Quinn (UTK)                      Permutation Group Symmetry and Correlations: Constructing Trial  
Wavefunctions for Quantum Liquid States 10m
- Xuejun Lu (UML)                      Quantum dot infrared photodetectors (QDIPs) 10m
- Rainer Martini (SIT)                      Bloch oscillations and QCLs : a 15 year race for a tunable THz  
source 10m



10.00 – 10.30 Break

10.30-12.00 Chair Na Lu

Mille Dresselhaus (MIT) TBA 20m

Natasha Litchinitser (UB) Metamaterials 10m

Xiaolei Li (PDF Solns) Si Quantum Started my Career 10m

Davorin Babic (JRD) All solid state lithium batteries 10m

Tim LaFave (UTD) Interaction of Electrons in a Nanosphere 10m

John Lofgren (Intel) TBA 10m

Daniel W. Boeringer (NGC) Ray Tsu's impact on my Career 10m

**Ray Tsu**

**Final remarks**

12.00- Lunch

Attendees

Elliot Brown (WSU)

Idalia Ramos (UPRH)

Philip Stiles + wife

Dick Greene (UNCC retired)

Bill Clark (ARO)

Art Ballato (ARL)

John Ballato (Clemson)

Bob Guenther (ARO)

Dave Witter (Anaxtal)