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NRI Technical Program Group Meeting

Mar. 02, 2017

Outline

- NRI personnel change
- NRI IP update
- E2CDA (NRI) on-site reviews
- NRI-NIST and E2CDA (NRI) semi-annual reports
  - Need volunteers to review reports
- Open mic

NRI Personnel Change

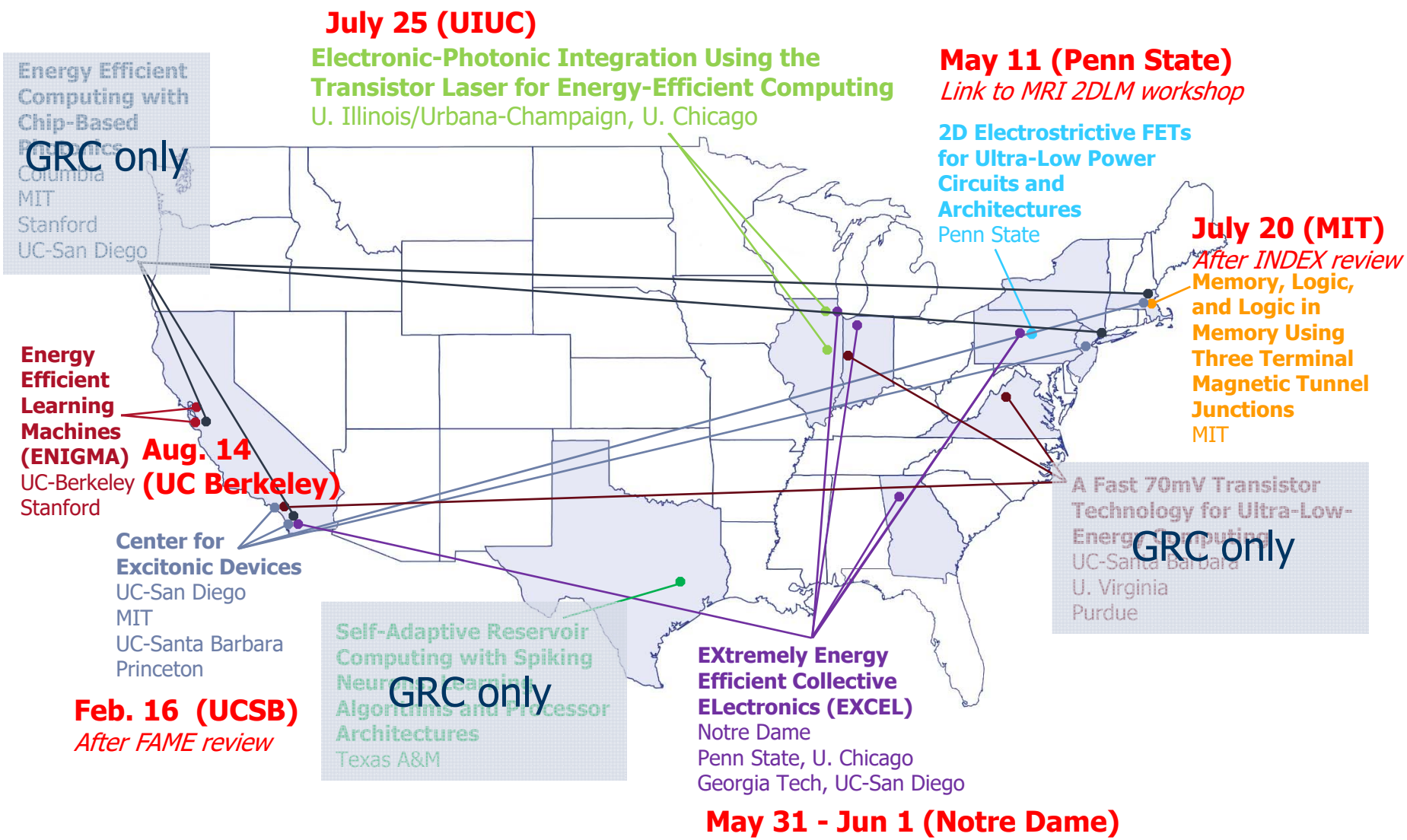
- Mary Altman will support NRI and nCORE in the future (mary.altman@src.org)

NRI IP Update

	IP	IP Filing	Center	Title	University	Inventors	Type	Status
Patent Issued	**IP1384N**	**P1448**	**INDEX**	**Graphene Device Including Angular Split Gate**	**University of Virginia**	**Avik Ghosh and Redwan Sajjad**	**Utility**	**Congratulations!!! Patent# 9,570,559 Issued 2/14/2017**
NEW	**IP1626N**		**INDEX**	**PRism Geometries in Graphene**	**University of Virginia**	**Avik Ghosh, Mirza Elahi and Yaohua Tan**		**PENDING: UVA is determining whether Prior Art exists**
Needs to be reviewed for Conversion to Utility App at **May 2017 TPG**; Due	IP1560N	P1613	NRI / STARnet Benchmarking	A Contencatable Magnetoelectric Magnetic Tunneling Junction Computational Device.	GA Tech	Azad Naeemi, Sourav Dutta and Chenyun Pan	Provsional	Provisional Application filed 7/19/2016
Needs to be reviewed for Conversion to Utility App at **August 2017 TPG**; Due 11/8/2017	IP1593N	P1650	CNFD	Magnetoelectric Memory Cell with Domain-Wall-Mediated Switching	University of Nebraska/Lincoln	Krill Belashchenko, Oleg Tchemyshyov and Alexander Kovalev	Provsional	Provisional Application filed 11/8/2016
Needs to be reviewed for Conversion to Utility App at **Oct 2017 TPG**; Due	IP1586N	P1668	CNFD	UMMTJ (Unipolar Magnetoelectric Magnetic Tunnel Junction)	UT Dallas	Nishtha Sharma and Andrew Marshall	Provsional	Provisional Application filed 1/23/2017
reviewed for Conversion to Utility App at **November 2017 TPG**; Due 2/17/2018	IP1603N	P1676	CNFD	Anti-Ferromagnetic Magneto-electric Spin-Orbit Read Logic	University of Nebraska/Lincoln	Peter Dowben, Christian Binek, Xia Hong, Jonathan Bird and Kang Wang	Provsional	Provisional Application filed 2/17/2017

- Will review provisional IPs to decide whether to file full application
- IP budget needs to be considered beyond 2017

E2CDA (NRI) On-site Reviews

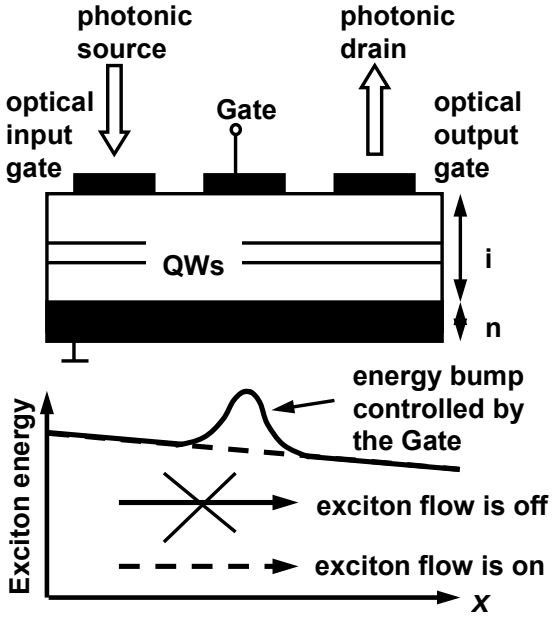


First E2CDA (NRI) On-site Review

"Excitonic Devices" at UCSD, Feb. 16, 2017

Agenda

Time	Title	Speaker
8:45 - 9:00 am	Set up room, get posters set up, site visit team arrives	
9:00 - 9:15 am	Project Overview	Leonid Butov (UCSD)
9:15 - 10:00 am	Theme Experimental studies of excitonic devices	Leonid Butov (UCSD)
10:00 - 10:45 am	Theme Theoretical studies of excitonic devices	Michael Fogler (UCSD)
10:45 - 12:45 pm	Lunch Break (Faculty club) Posters (4322 Mayer Hall)	
12:45 - 1:30 pm	Theme Design and growth of heterostructures	Loren Pfeiffer (Princeton, remotely)
1:30 - 2:15 pm	Theme Interaction of light and matter in excitonic devices	Vladimir Bulović (MIT)
2:15 - 2:45 pm	Theme Epitaxial growth of semiconductor structures	Daehwan Jung (UCSB)
2:45 - 3:00 pm	Coffee Break	
3:00 - 4:00 pm	Facility Tour	
4:00 - 5:00 pm	NRI Internal Discussion	
5:00 - 6:00 pm	Debrief with NRI/Faculty	
6:30 pm	Dinner	



NRI participants: Dmitri Nikonov (Intel), Steve Kramer (Micron), Arup Polley (TI), An Chen (NRI/IBM)

Proof of concept: in III-V QWs at 110K
RT operation: high binding energy in TMD
Long lifetime: indirect exciton

Status: RT exciton in TMD with 10s of ns lifetime
Next step: control exciton transport and gating

Review Semi-Annual Reports

Deadline: Mar. 31 to submit NRI-NIST center reports to NIST
Review timeline: Please return feedback by Mar. 15; center revision Mar. 15-30

Centers/Projects	**Volunteer reviewers**
INDEX center	Wilfried Haensch
SWAN center	Ravi Pillarisetty
CNFD center	Steve Kramer
Benchmarking	Dmitri Nikonov
EXtremely Energy Efficient Collective ELectronics (EXCEL)	Steve Kramer, Seyoung Kim, Wilfried Haensch
Excitonic Devices	Dmitri Nikonov
Electronic-Photonic Integration Using the Transistor Laser for Energy-Efficient Computing	
Memory, Logic, and Logic in Memory Using Three Terminal Magnetic Tunnel Junctions	Ching-Tzu Chen
2D Electrostrictive FETs for Ultra-Low Power Circuits and Architectures	
Energy Efficient Learning Machines (ENIGMA)	Geoff Burr

NRI Center Reviews and Annual Review

- NRI/STARnet Benchmarking mid-Year Review (Apr. 6 and 13, via WebEx)

- INDEX review: Jul. 18-19, Columbia U.
- CNFD review: Aug. 29-30, U. Nebraska at Lincoln
- SWAN review: Sep. 13-14, Austin, TX

- NRI Annual Review: Gaithersburg, MD
  - NRI Final Annual Review: Oct. 17
  - NRI/STARnet Benchmarking Workshop: Oct. 18
  - E2CDA Annual Review: Oct. 19-20

Open Microphone