

NSERC CREATE **TOP-SET** Un programme  
FONCER du CRSNG

### Séminaire

Le jeudi 9 août 2018, 15h30  
Des rafraîchissements seront servis dès 15h  
Complexe de recherche avancée, pièce 233  
Université d'Ottawa, 25, rue Templeton  
\*Le séminaire se déroulera en anglais.\*

[Gratuit, inscription requise](#)

### Seminar

Thursday, August 9, 2018, 3:30 p.m.  
Refreshments served at 3 p.m.  
Advanced Research Complex, room 233  
University of Ottawa, 25 Templeton Street

[Free, registration required](#)

## Large area inverted metamorphic ELO solar cells

Rao Tataavarti, MicroLink Devices

**Abstract:** Development of low cost, high efficiency, lightweight and flexible solar cells with an efficiency performance reaching 40% (1 Sun, AM0) is very important for next generation space technology which can enable novel space applications. At MicroLink for the past several years, efforts have been directed towards developing Epitaxial Lift Off (ELO) for realizing high efficiency, lightweight solar cells for space application. These solar cells are based on III/V multijunction technology on Gallium Arsenide (GaAs) substrates. ELO technology offers a unique solution to increase the specific power of a solar cell by completely eliminating the substrate weight. ELO technology also enables multiple substrate re-usages thereby providing a realistic cost reduction pathway for the multijunction solar cells. In this talk, I will present recent work done at MicroLink on development of  $\eta > 30\%$  (AM0, 1 Sun) inverted metamorphic (IMM) triple junction (TJ) on 6-inch wafers. I will present recent work on IMM solar cells with quantum dots (QDs) embedded in the GaAs middle cell and application of wavelength selective photonic structures to IMM devices, and their radiation tolerance will be discussed. I will also discuss application of ELO cells in the form of flexible sheets for UAV and mobile solar applications.

**Bio:** Dr. Rao Tataavarti has been the Technical Director at MicroLink Devices, Chicago since 2007 and is responsible for the development of new technologies for high efficiency solar cells for space and terrestrial applications. Dr. Tataavarti received his PhD degree in Solid State Physics from the University of Delhi, India, in 1985. Prior to joining MicroLink, he led the high-power laser epitaxy group at Alflight, Madison. Before that, Dr. Tataavarti worked at the National Research Council of Canada and Nortel Networks, both in Ottawa, as well as NTT Basic Research Labs. In his current position, Dr. Tataavarti has led several multi-million-dollar programs funded by DOE, Air Force, Navy, Army, NASA and DARPA projects on ELO of multijunction solar cells for concentrated photovoltaics, space and UAV applications. Dr. Tataavarti was instrumental in developing the triple junction IMM solar cells at MicroLink which reached efficiencies of 30% AM1.5 (2009) and more recently successfully developed wafer bonded triple junction solar cells (2010) and IMM cells with QDs in GaAs subcell (2016). Dr. Tataavarti's interests include epitaxial growth, device processing, sub-systems, and systems development and testing for telecom and non-telecom related applications. Dr. Tataavarti has published over 80 papers in refereed international journals and conference proceedings. He has also served as symposium organizer for PV related materials and devices at MRS, IEEE PVSC, Gordon Research and other international conferences. Dr. Tataavarti is a referee for several international and national publications, including IEEE Electron Devices and Letters, Progress in PV materials and Devices, Solar Materials and Devices, IEEE J Photovoltaics, Thin Solid Films, JAP and APL.

TOP-SET est un programme de formation FONCER du CRSNG en puissance optoélectronique ayant pour but de façonner une cohorte de personnel hautement qualifié détenant des connaissances approfondies en systèmes optoélectroniques pour joindre les rangs d'équipes de recherche et développement.

Pour de plus amples renseignements sur TOP-SET, veuillez consulter [create-topset.eecs.uottawa.ca/fr](http://create-topset.eecs.uottawa.ca/fr).

NSERC CREATE Training in Optoelectronics for Power: from Science and Engineering to Technology (TOP-SET) is a training program that aims to form a cohort of highly qualified personnel with comprehensive understanding of optoelectronic systems, capable of joining advanced R&D teams.

For further details regarding TOP-SET, go to [create-topset.eecs.uottawa.ca](http://create-topset.eecs.uottawa.ca).



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