

## Séminaire

Le mardi 7 janvier 2020, 14h45  
Des rafraîchissements seront servis dès 14h15  
Complexe de recherche avancée, pièce 233  
Université d'Ottawa, 25, rue Templeton  
\*Le séminaire se déroulera en anglais.\*

## Seminar

Tuesday, January 7, 2020, 2:45 p.m.  
Refreshments to be served starting at 2:15 p.m.  
Advanced Research Complex, room 233  
University of Ottawa, 25 Templeton Street

### Defect kinetics and reliability of silicon cells and modules

Mariana Bertoni, Arizona State University

**Abstract:** The conventional ribbon tabbed, glass-backsheet module configuration may start seeing a market decline as bifacial, all glass, frameless and high capacity panels start hitting the market and becoming mainstream. PV modules with novel configurations, like shingles and all metallic backsheet implement electrical conductive adhesive and advanced architectures to reduced interconnection losses. Canadian Solar is promoting glass-glass PV modules with 30-year performance warranty based mostly of its robust mechanical performance. These new configurations and assembly techniques translate into significantly different: (1) stress distribution on the cells, (2) water ingress profiles and (3) sodium (PID inducing) diffusion profiles. While the community currently has a good understanding of the mechanisms and rates that drive failure on standard PV modules, new materials and processes open the door to new failure modes and degradation rates. In this talk, we will present novel module inspection methods to address water intake in modules as well as cell deflection and stress. We will also show our modeling efforts to build a comprehensive Defect-Device-Degradation Model that can be applied to assess new bill of materials and architectures.

**Bio:** Mariana Bertoni is an Associate Professor in the department of Electrical, Computer and Energy Engineering at Arizona State University, with special appointments in the department of Materials Science and Engineering and Chemistry. Prior to this, she held senior scientist positions at two emerging start-up firms in the photovoltaic industry and a visiting scientist appointment at the Massachusetts Institute of Technology (2010-2012). Her previous postgraduate experience includes a postdoctoral appointment at the Massachusetts Institute of Technology (2008-2010), a Marie Curie postdoctoral fellowship at Creavis Technologies & Innovation in Germany (2007-2008) and a visiting researcher appointment at the National Renewable Energy Laboratory. She most recently received the National Academy of Engineering, Grainger Foundation Frontiers of Engineering Award for Advancement of Interdisciplinary Research, and was invited by the National Academy of Engineering, US Frontiers of Engineering as 100 of the nation's outstanding young engineers. She serves on the editorial board of the Journal of Physics D: Applied Physics and has participated in the program committee of the IEEE Photovoltaic Specialists Conference (PVSC) for more than ten years.



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 rejoindre les rangs d'équipes de recherche et développement.

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