

En collaboration avec la série de colloques du département de physique
In collaboration with the Department of Physics Colloquium Series

Séminaire

Le jeudi 9 mars 2023, 14h30

[MS Teams](#)

Le séminaire se déroulera en anglais.

Seminar

Thursday, March 9, 2023, 2:30 p.m.

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Valley Photovoltaics: A New Approach Towards the Hot Carrier Solar Cell

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Abstract: Hot carrier solar cells are a proposed next-generation photovoltaic technology for overcoming the single-gap efficiency limit. Through maintenance of a population of high energy carriers and extraction at better than band gap photovoltage, an enhanced solar conversion efficiency could be maintained. Proof-of-principle has been demonstrated for hot carrier generation and maintenance, both by mitigating thermalization mechanisms through the creation of a phonon bottleneck, and through exploitation of intervalley scattering mechanisms to stabilize hot carriers in upper valleys of the band structure in the emerging field of valley photovoltaics (VPs). Intervalley scattering properties have been shown to provide an accessible pathway for VP operation. However, further development of this VP architecture is required to enhance solar cell operation that increases both the efficacy of carrier extraction from the satellite valleys, and the establishment of electric fields inside the device to provide lower energy carriers access to this upper valley extraction pathway.



Bio: Ian Sellers received his Bachelor's degree from the University of Liverpool in 1999, a Master Degree from Imperial College London in 2001, and a PhD in Physics from the University of Sheffield in 2004. Between 2004 – 2006, Dr. Sellers was a Marie Curie Fellow at CRHEA-CNRS in Valbonne, France, a position that was followed by a postdoctoral position at the University at Buffalo. In 2008, Dr. Sellers joined Sharp Laboratories of Europe in Oxford, UK where he also held the position of Visiting Academic Fellow in the Department of Materials at the University of Oxford. After spending three years in Industry, Dr. Sellers returned to the academic environment taking a position at the University of Oklahoma in 2011 where he is currently a Ted S. Webb Presidential Professor. In addition to his faculty position at OU, Dr.

Sellers is also the Associate Director of the Oklahoma Photovoltaics Research Institute.

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.

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