



## Online Registration

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18<sup>th</sup> April 2016, Monday



# Indium-Gallium-Zinc Oxide Thin-Film Transistor with Annealing-Induced Homojunctions

<b>Speakers:</b>	<b>Prof. Man Wong</b> Professor, Department of Electronic & Computer Engineering, HKUST
<b>Date:</b>	18 <sup>th</sup> April 2016, Monday
<b>Time:</b>	10:30 – 11:30 am (Registration starts at 10:15 am)
<b>Venue:</b>	Room 501 – Room 502, 5/F, Photonics Centre, 2 Science Park West Avenue, Hong Kong Science Park, Shatin, Hong Kong
<b>Language:</b>	English
<b>Online Registration:</b>	<a href="http://www.astri.org/registration-form/?pid=15941">http://www.astri.org/registration-form/?pid=15941</a>

## Speaker's Biography



**Prof. Man Wong** was born in Beijing, China. From 1979 to 1984, he studied at the Massachusetts Institute of Technology, USA, where he obtained his BS and MS degrees in Electrical Engineering. From 1985 to 1988, he was at the Center for Integrated Systems at Stanford University, USA, where he worked on tungsten-gate MOS technology and obtained his PhD degree, also in Electrical Engineering. From 1988 to 1992, he was with the Semiconductor Process and Design Center of Texas Instruments, USA and worked on the modeling and development of integrated-circuit metallization systems and dry/vapor surface-conditioning processes. He is currently with the Department of Electronic and Computer Engineering at the Hong Kong University of Science and Technology, Hong Kong. His research interests include micro-fabrication technology, device structure and

material; physics and technology of thin-film transistor; organic light-emitting diode display technology; modeling and implementation of integrated micro-systems; and thin-film solar cell device and process technology. He is a member of Tau Beta Pi, Eta Kappa Nu and Sigma Xi. He was appointed an Honorary Guest Professor of Nankai University, Tianjin, China, in 2003; a Visiting Professor of Soochow University, Suzhou, China, in 2011; a Distinguished Visiting Professor of the State Key Laboratory of Transducers Technology at the Institute of Microsystems and Information Technology of the Chinese Academy of Sciences, Shanghai, China, in 2015; and a Visiting Professor of Xiangtang University, Xiangtang, China, in 2015.

## Abstract

The resistivity of an indium-gallium-zinc oxide (IGZO) thin film was found to depend on not only the conditions of its thermal annealing but also the oxygen-permeability of the cover film during the heat-treatment. Based on this observation, a technology for constructing a homojunction IGZO thin-film transistor (TFT) has been developed and demonstrated. In this device architecture, the junction and channel regions were capped respectively by impermeable and permeable covers. During a subsequent junction “activation” heat-treatment in an oxidizing atmosphere, the resistivity of the source and drain regions were greatly reduced; while the channel region, being exposed to the oxidizing atmosphere through the permeable cover, retained its highly resistive character. The permeable cover could serve additionally as an etch-stop during the removal of the impermeable cover over the channel region, thus preventing the region from being exposed to the etch.