



## Prof. Vladimir Chigrinov

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### Short Course Title

Liquid crystal applications in displays and photonics: new trends

### Abstract

Liquid crystal (LC) devices for displays and photonics are dominating in the market and will be the basic technology for advanced display and electronics in the nearest 10 years. LCD production grows tremendously in mainland China and will soon become higher than the overall LCD production in Korea and Taiwan. Photoalignment materials can be effectively used in LC alignment and patterning for new generations of LC devices that provide extremely high resolution and optical quality of alignment both in glass and plastic substrates, photonics holes etc [1]. New fast ferroelectric LC materials are successfully compete with OLED and aggressively coming to the market [2]. LCD brightness and resolution are still superior in comparison with OLED and new LCD applications in virtual reality and augmented reality (AR/VR) are foreseen. LCD devices with mini LED backlight dimming provide the contrast ratio comparable or even higher than OLED. New liquid crystal display and photonics devices include: (i) fast high resolution LC display devices, such as field sequential color ferroelectric LCD; (ii) LC sensors; (iii) LC lenses; (iv) LC E-paper devices, including electrically and optically rewritable (ORW) LC E-paper and security films; (v) photo induced semiconductor quantum rods alignment for new LC display applications; (vi) 100% polarizers based on photoalignment; (vii) LC smart windows with voltage controllable transparency; (viii) LC antenna elements with a voltage controllable frequency and direction of radiation; (viii).

[1] V.G. Chigrinov et al., Photoalignment of liquid crystalline materials, Wiley, 2008.

[2] V.G. Chigrinov, Liquid Crystal Photonics, Nova Science Publishers, 2015.

### Speaker Biography

Professor Vladimir G. Chigrinov is Professor of Hong Kong University of Science and Technology since 1999. He is an Expert in Flat Panel Technology in Russia, recognized by the World Technology Evaluation Centre, 1994, Senior Member of the Society for Information Display (SID) since 2004 and SID Fellow since 2008. He is an author of 6 books, 25 reviews and book chapters, about 295 journal papers, more than 644 Conference presentations, and 114 patents and patent applications including 32 US patents in the field of liquid crystals since 1974. The paper of M.Schadt, K.Schmitt, V.Kozenkov, V.Chigrinov, Surface-induced parallel alignment of liquid crystals by linearly polymerized photopolymers, Jap. J. Appl. Phys. P.I., Vol.31, pp. 2155-2164 (1992) is number 4 among the most heavily-cited and have been influential papers published in JJAP since the first volume (1962) and have been selected from the various fields of applied physics by the JJAP Editorial Board.

He got Excellent Research Award of HKUST School of Engineering in 2012. He obtained Gold Medal and The Best Award in the Invention & Innovation Awards 2014, in Kuala Lumpur, Malaysia, on Feb 2014. He is Guest Professor in Shanghai Jiatong University since April 2014. He is a Member of European Academy of Sciences (EUAS) since July 2017. He got A Slottow Owaki Prize of SID in 2018 "For his educational efforts in the field of liquid-crystal devices, as evidenced by his teaching, supervision of graduate students, and prolific publications and conference presentations." He is a member of the team, which get the Best Display Prototype in I-zone in Display Week 2018.