

Seminar

PhD in Engineering and Applied Science for Energy and Industry

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January 14th 2025, 16-17.30: The fascinating history of Light Emitting Diode Revolution, and the associated challenges.

Virtual room: <https://meet.google.com/agt-dxfs-ddn>

January 15th 2025, 16-17.30: Sustainable Smart Lighting systems, dream or reality?

Virtual room: <https://meet.google.com/vrt-cnnd-tta>

Towards to “Lighting 4.0” era: from the LED technological revolution to the “Sustainable Smart Lighting” concept

During the last decade, SSLs-Solid-State Lighting based on components like LEDs, OLEDs and LDs, challenges conventional technologies. LED has turned into a game changer beating conventional technologies in all aspects. Today, SSLs proceed to replacing of all legacy technologies: a revolution in the lighting market. Artificial light production absorbs around 2 900 TWh corresponding to 13,7% of the world’s electricity annual production. The massive adoption of LED technology during the next years can contribute to harness electricity use for lighting, up to 4% by 2030. As LED technology matures, maximizing the energy savings from connected SSL systems will become increasingly dependent on successful integration into the built environment. Today, we are witnessing a transition from the conventional “analogue” lighting technologies to “digital” lighting. Intelligent lighting will become the backbone for smart homes and smart cities. Industry has coined a new term “integrative lighting” to draw renewed attention to its primary effort to be successful in meeting society’s needs. However, “rebound effect”, known also as “Jevons paradox”, can blur this march forward. One potential solution to avoid that negative effect consists in switching to smart integrative lighting driven by both “application efficiency” and quality of light. This technological revolution shall comply with the SSL2 concept, which consists of sustainable smart lighting systems based on solid-state lighting devices, might stop that harmful effect. Smart, and affordable integrative lighting that incorporates light quality is driven by “appliance efficiency.” This merely suggests that the “Right Light” should be provided by next-generation lighting systems with the best levels of quality and efficiency when and where it is needed.



Prof. Georges ZISSIS, PhD, FMIEE, Vice-Dean of Faculty of Science and Engineering of Toulouse III University, graduated in 1986 from Physics department of University of Crete in general physics. He got his MSc and PhD in Plasma Science in 1987 and 1990 from Toulouse III University (France). He is full Professor in the same University. His primary area of work is Light Systems Science and Technology. He is interested in sustainable smart lighting systems; metrology issues for solid-state lighting systems; standardization and quality issues of light sources; impact of lighting to energy, environment, quality of life, health and security; illumination and lighting. He is director of “Light & Matter” research group of Laplace laboratory. In December 2006, he received the 1st Award of the International Electrotechnical Committee (IEC) Centenary Challenge. In 2009, he won the Energy Globe Award for France and in 2022 he was awarded the Alfred Monnier Medal. He was President IEEE Industrial Application Society (2019-20), and President of the Power Electronics, Electronics, Optoelectronics and System section of the French National Council of Universities (2014-19). He initiated and chaired the IEEE Smart Lighting Initiative under IEEE Future Directions umbrella.

