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Discharge lamps: current challenges, perspectives and threats

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In Europe, the incandescent lamp is currently being phased out, and the halogen lamp is likely to follow soon. The successors of these inefficient light sources are discharge lamps and LEDs. It has become fashionable to consider discharge lamps as "old fashioned" and LEDs as "modern." However, there are application areas where it will take a long time before LED actually can take over from discharge lamps, if that ever happens. Especially when a lot of light is required in a point source, LEDs suffer from the requirement that their temperature does not exceed certain values. At present, both low pressure plasmas (fluorescent tubes and compact fluorescent lamps) and high pressure plasmas (HID lamps and UHP lamps) are used for lighting applications. Most of these lamps contain mercury. The challenges that discharge lamp scientists, as ever, face are: the elimination of mercury, increasing the color rendering index, solving the hot re-strike problem in high pressure lamps, and increasing the luminous efficacy. In this presentation we will give a few examples of recent research in these directions, and we will speculate on the perspectives of discharge lamp science.