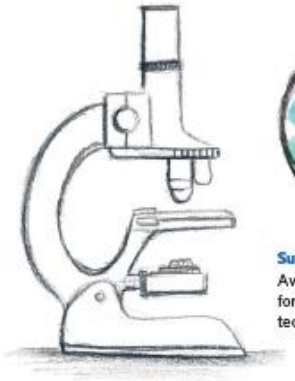
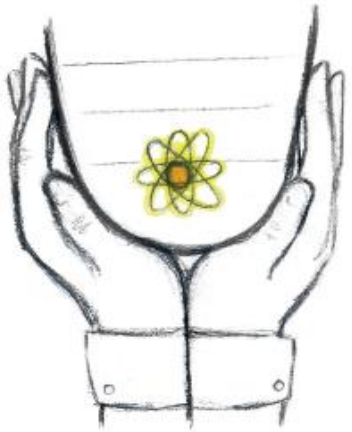
Photonics in research

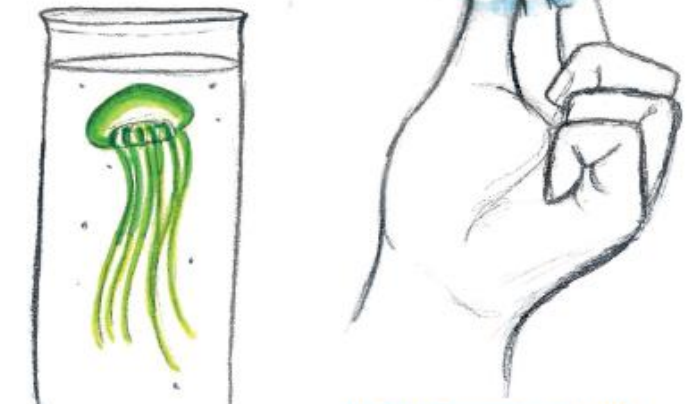
- 14 Nobel Prize laureates in the field of photonics during the last decade



Surpassing the limitations of the light microscope (2014).
Awarded to Eric Betzig, Stefan W. Hell and William E. Moerner for the development of super-resolved fluorescence microscopy techniques that surpass the diffraction limit of light.

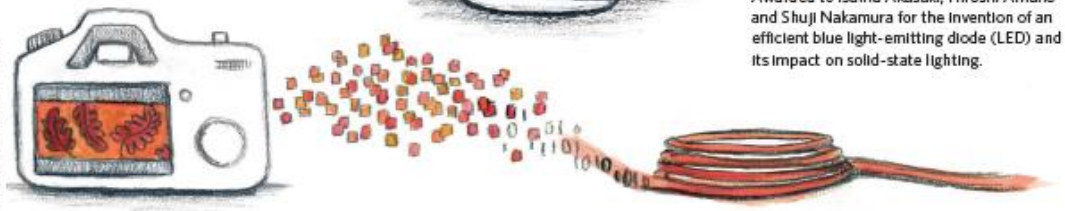


Glowing proteins: a guiding star for biochemistry (2008).
Awarded to Osamu Shimomura, Martin Chalfie and Roger Y. Tsien for the discovery and development of the green fluorescent protein (GFP) as a tagging tool in bioscience.



Particle control in a quantum world (2012).
Awarded to Serge Haroche and David J. Wineland for ground-breaking experimental methods that enable the measurement and manipulation of individual quantum systems.

New light to illuminate the world (2014).
Awarded to Isamu Akasaki, Hiroshi Amano and Shuji Nakamura for the invention of an efficient blue light-emitting diode (LED) and its impact on solid-state lighting.



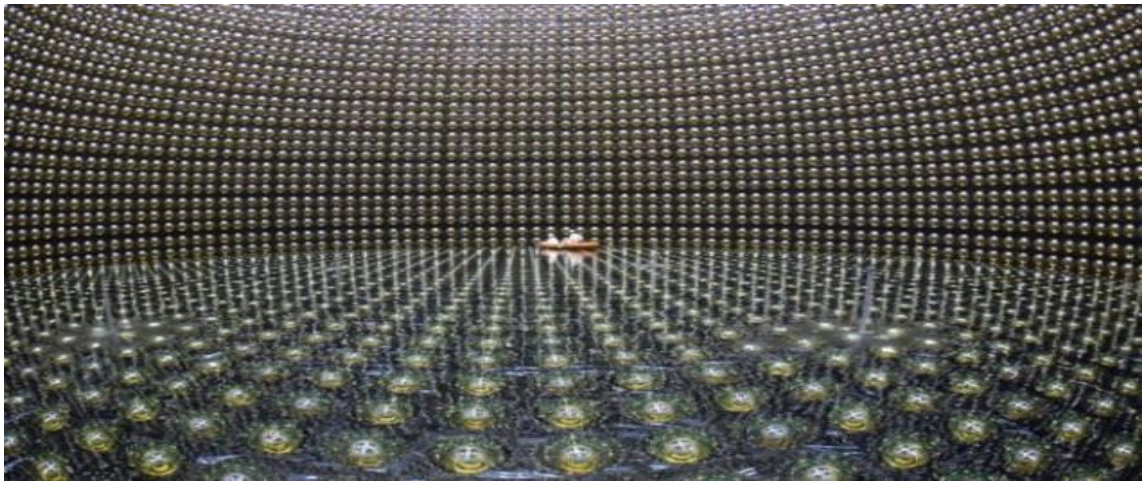
Masters of light (2009).
Awarded to Charles K. Kao for pioneering achievements in optical fibre communication and Willard S. Boyle and George E. Smith for the invention of the charge-coupled device (CCD) image sensor.

ILLUSTRATIONS BY BETHANY VUKOMANOVIC

Photonics in in research

- Many Nobel Prizes *enabled* by photonics

For example : The Nobel Prize in Physics 2015 awarded to Takaaki Kajita and Arthur B. McDonald *"for the discovery of neutrino oscillations, which shows that neutrinos have mass"* was enabled by thousands of 20-inch PMT photon counters



Photonics plays a vital role in our daily lives and is an imperative cross-cutting discipline of science in the 21st century

- ✓ The crucial role photonics is expected to play in 21'st century is acknowledged by numerous reports of committees from US and Europe:
  - National Photonics Initiative (NPI) white paper : " US prosperity and security through the science and application of light", 2016
  - US National Research Council report : "Optics and Photonics: Essential Technologies for Our Nation", National Academy Press 2013.
  - UK Institute of Physics (IoP) and Engineering and Physical Sciences Research Council (EPSRC) report: "Optics and Photonics: Physics enhancing our lives" IoP and EPSRC, September 2009.
  - US National Research Council report : "Harnessing Light: Optical Science and Engineering for the 21st Century." National Academy Press 1998.
  - US National Research Council report : "Photonics: Maintaining Competitiveness in the Information Era", National Academy Press 1988.
  - Photonics 21-A key Enabling Technology for Europe