

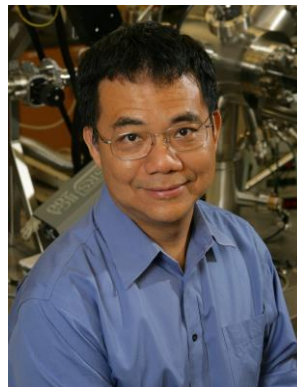
Prof. Yang Yang

UCLA Distinguished Professor and

The Carol and Lawrence E. Tannas Jr. Endowed Chair in Engineering

Department of Materials Science and Engineering, UCLA

<http://yylab.seas.ucla.edu/PI.html>



PhD: Physics and Applied Physics, U-Massachusetts, Lowell, 1992;

Advisors: Prof. Sukant Tripathy (deceased) and Jayant Kumar

MS.: Physics and Applied Physics, U- Massachusetts, Lowell, 1988

BS.: Physics, National Cheng-Kung University, Taiwan, 1982

*Prof. Yang's major research interests are in the solar energy and highly efficient electronic devices. He has more than 450 refereed-papers (including book chapters) **total citations of >125,000**; 24 issued patents, and 200 plenary, keynote, and invited talks. His **H-Index is ~168 as January 2022**. His major contribution to the organic photovoltaics (OPV) community includes the understanding of polymer morphology and its influence on device performance; the inventions of the inverted organic solar cell, inverted tandem solar cell; and transparent solar cells; reported several novel polymers as absorbing materials with large open-circuit voltages. These efforts have enabled series of breakthroughs in OPV history, including record-high efficiencies certified by NREL in 2009 (7%), 2011 (8.6%), and 2012 (10.6%). Since 2013, he has also engaged in hybrid perovskite solar cell, and achieved 19.3% efficiency via interface engineering in 2014. Other research areas include: solution processible graphene, and CIGS/CZTS solar cells.*

Technical Achievements:

- World record efficiency of 22.4% (NREL certified) perovskite/CIGS tandem solar cell. (2017).
- Demonstrated 19.3% PCE of perovskite solar cell. (2014)
- In the past ten years, Yang has consistently promoted the organic solar cell efficiency from 4% (2005) to break the 10% technical (and commercialization) barrier (2012), and reached 11.5% in 2014. He has been pioneering the organic tandem solar cell technology in the past five years.
- Invented the inverted polymer solar cell (2008) and inverted polymer tandem solar cell (2010). The inverted organic solar cell has become the industry standard in manufacture.
- Invented a high yield solution-process for producing large-area graphene flakes. (2007)
- Invented organic memory device by utilizing a nano-particle embedded polymer matrix. (2004)
- Invented organic vertical transistors for organic displays. (2001)
- Inventor of the interfacial layer which improves metal/organic interface, and enables Ohmic contact between the metal and organic interface. The concept of interfacial layer has been widely applied in OLED displays and solar cells. (1994)
- His technology has enabled five startups: Horizon PV (2014); Solarmer Energy Inc. (2006); Silanna (in Australia, 2007); ORFID Corp. (Los Angeles, 2004-2006); Coatue Technology (2001, Cambridge, Massachusetts, acquired by AMD in 2003). Currently, he is serving the Advisor to Solarmer Energy Inc. and Horizon PV Inc.

Honors and Awards:

Member, the European Academy of Science (EURASC), 2021.

Advanced Materials Hall of Fame, 2021

Fellow of American Association for the Advancement of Science, 2019

Sustainable Energy Award. UK Royal Society of Chemistry, 2019.

Distinguished Alumni Award, National Cheng-Kung University, Taiwan, 2016.

The World's Influential Scientific Mind, by Thomson Reuters (19 people elected, 2016)

Fellows of MRS (2015); Royal Society of Chemistry (2014); the E-M Academy (2014), SPIE (2013).

Thomson Reuters Highly Cited Researcher in Chemistry and Materials Science (2014, 2015, 2017, 2017)

The Carol and Lawrence E. Tannas Jr. Endowed Chair in Engineering, (2011)
Top Hot Researcher in 2010, Science Watch (published by Thomson Reuters), only 11 scientists were selected, including Andre Geim, the Nobel Prize Laureate in Physics, (2010).
Highest cited Paper in 2010, journal of Advanced Functional Materials
Highest cited Paper in 2008-2010, Journal of American Chemical Society (JACS)
IEEE Photovoltaic Expert, (2009).
Semiconductor Research Association Invention Award (2008); NSF Career Award (1998).

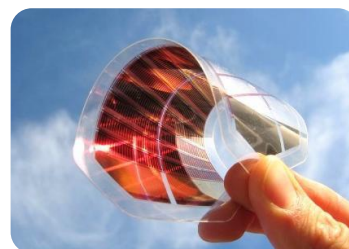
PROFESSIONAL EXPERIENCE

UCLA (University of California, Los Angeles) (1997 – present):

UCLA Distinguished Professor (2019 – present) and
The Carol and Lawrence E. Tannas Jr. Endowed Chair in Engineering, July 2011-present
 Nano Renewable Energy Center, California Nano-System Institute, Faculty Director, (2007-present).
 Materials Science and Engineering, Professor (02-now), Associate Professor (98-02), Assistant Professor (97-98)

Current research focuses on the following major areas on electronic and optoelectronic materials and devices based on solution processible organic, inorganic and nano materials:

- (a) Thin film solar cell based on organic and hybrid perovskite materials: Yang's group emphasizes on fundamental understanding of the device physics, material science and processing, subsequently applying the knowledge in designing unique device architectures, novel donor/acceptor materials, and interfaces to achieve high efficiency and performance.
- (b) Transparent OPV cells: By utilizing the IR part of the solar spectrum, Yang's group has demonstrated highly efficient and transparent OPV devices. The transparency reaches 70% in the visible, and the efficiency reaches more than 5% PCE.
- (c) Thin film PV based on CIGS and CZTS: Our research focuses on the understanding the band structure of the CIGS/CZTS and its relationship to the formation and composition of the nano-crystal, and the influence to the device characteristics the interface engineering.
- (d) Metal oxide transistors. Yang's group also work on solution processible metal oxide transistor since 2013. His group has reached mobility of $\sim 40 \text{ cm}^2/\text{Vs}$ mobility for IGZO based transistor.



Flexible organic solar cell, a revolutionary technology. The OPV panel can be easily installed and used.

du Pont Display in Santa Barbara (Former UNIAX Corporation), (1992-1996), Staff Scientist.

University of California-Riverside, (1991-1992) Postdoc in Chemistry Department

PROFESSIONAL SOCIETIES:

Materials Research Society, MRS
 American Chemical Society, ACS
 American Physical Society, APS
 SPIE—The International Society for Optical Engineering, SPIE
 Society of Information Displays, SID
 Institute of Electrical and Electronics Engineers (IEEE)
 Faculty Director of SID UCLA Student Chapter.
 Organized two International Conferences on OLED (2001) and Organic Electronics (2013) at UCLA, and multiple symposiums on organic electronics for MRS and SPIE.