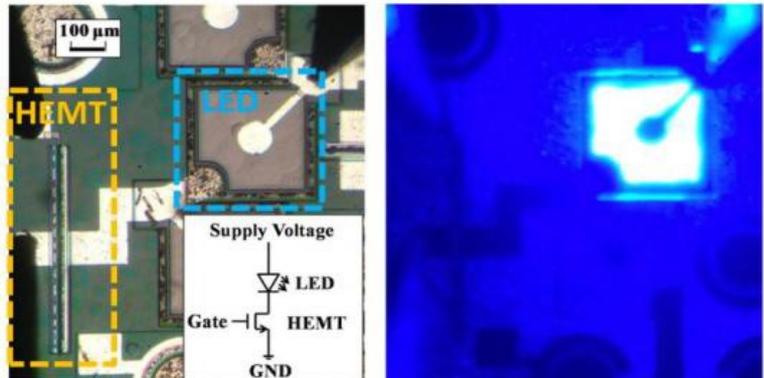


==> Insights:

1. Rensselaer Polytechnic Institute (RPI) integrates transistor and LED on the same chip maximizing the light extraction efficiency of LED's and lowering cost through simpler materials.

–Researchers at RPI have integrated power transistor HEMT (High Electron Mobility Transistors) in GaN layers along with and LED structure.



–T. Paul Chow, Professor at RPI said, "Eliminating the MOSFET is the first step. We can add the gate driver circuitry,

and then more integration to realize a power converter." The single HEMT could also control multiple LED's on one chip. Chow terms the new type of device as light-emitting integrated circuit (LEIC).

Ref: <http://ledsmagazine.com/news/10/6/11>

2. Efficient LED lamp for African fisher's profit.

–African fisheries use kerosene lamps to do fishing at night. The LED lamps would improve the profit by 10 folds in long term. The initial setup seems to be the major hurdle to the technology. Mark McHenry, lead author says "As the light sometimes does not travel far through the water due to murky conditions, having a light that can be immersed in water is the most efficient means of getting light to more fish [resulting in their catch]."

Ref: <http://www.scidev.net/sub-saharan-africa/fisheries/news/efficient-led-lamp-could-help-african-fishers-profit.html>

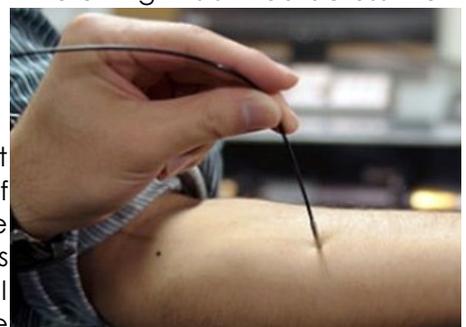
Image courtesy: http://fishinglight.en.alibaba.com/product/211100373-200276535/Marine_Fisheries_led_light.html



3. Detecting Diabetes by shining a light?

–The most general way to know about diabetes is to painfully pierce the injection and test the blood sample. Researchers from MIT have now come across a technology wherein light is shined across the skin (as shown in the figure) and by the principle of Raman Spectrometry, the device identifies the chemical compounds in the blood.

–The problem with near infrared light is that it can penetrate short distance into the skin, thus detecting the glucose level of surrounding the skin cell but not the of the blood stream. Hence the MIT team has now resolved the problem by using an algorithm (mass transfer model) to relate the blood glucose level with interstitial glucose level. The plan is to make laptop size device ready to be commercialized at \$200.



Ref: <http://physicsworld.com/cws/article/news/2010/aug/18/shining-a-light-on-diabetes>

Image Courtesy: <http://physicsworld.com>

==> Business:

1. IBM, STMicro consortia to set up semiconductor wafer fabrication unit in India:

- Government has approved setting up of two semiconductor wafer fabrication plant in India. The first fab is proposed by Jaiprakash Associates, IBM and Israel based Tower Jazz at Greater Noida. The second fab is proposed by Hindustan Semiconductor Manufacturing Corporation (HSMC), STMicroelectronics and Malaysian company Silterra at Prantij, Gujarat around 40 kms from Gandinagar.

- The government has approved for incentives such as deduction available for expenditure in R&D, investment linked deduction under Section 35D of Income Tax Act. They will also avail Viability Gap Funding (VGF) in form of interest free loan for 10 years.

Ref: http://www.eetindia.co.in/ART_8800689823_1800007_NT_c64b050a.HTM?click_from=8800105220,9950257285,2013-09-16,EEIOL,ARTICLE_ALERT&jumpto=view_welcomead_1379305940970

==> Patent News:

1. Nitride-Based Semiconductor Light Emitting Diode:

-In the nitride-based semiconductor LED, an area around a p-electrode pad, in which light is preferentially emitted is expanded so as to enhance light extraction efficiency, and local current crowding is prevented so as to reduce a driving voltage.

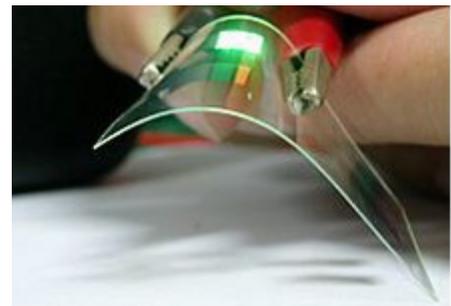
Ref:http://www.hispanicbusiness.com/2013/9/11/patent_issued_for_nitride-based_semiconductorlight.htm

==> So how does it work?

1.1. Organic light emitting diode (OLED)

What are organic compounds?

-Organic compounds come from nature, such as fats, protein, enzymes whose molecules contain one or more carbon atoms covalent bonded with another element or radical (H, N, O,P, Si). Few exceptions are CO, CO₂, cyanides, carbides, carbonates and thiocyanates. Nowadays this organic compounds could also be manmade.



-So how does it emit light?

-OLED is a solid state semiconductor device that is 100 to 500 nm thick, having two organic layers (emissive and conductive layers) including cathode and anode at the boundaries. When the electrical current flows from cathode to anode through organic layers, giving electrons to the emissive layer and removing electrons from the conductive layer. Removing electrons from conductive layer leaves holes for the electron-hole recombination process. As the electron jumps to the hole, OLED emits light. This principle is known as electrophosphorescence.

-So what are the drawbacks?

- The process to manufacture the OLED is extremely expensive, it has limited lifetime and has color balance issues.

Ref: <http://electronics.howstuffworks.com/oled.htm>

Image courtesy: www.wikipedia.com

Feedbacks and comments are welcomed. Editor: Uttam Pal, can be reached at upa@dstlworld.com