

Evento CentraTec per l'insediamento del Comitato Consultivo degli stakeholders
17 Marzo 2023 – Area della Ricerca CNR di Firenze
«L'innovazione abilitante per le imprese: case history dell'Area CNR di Firenze»

EmoLED: luce blu per la guarigione delle ferite

Francesca Rossi
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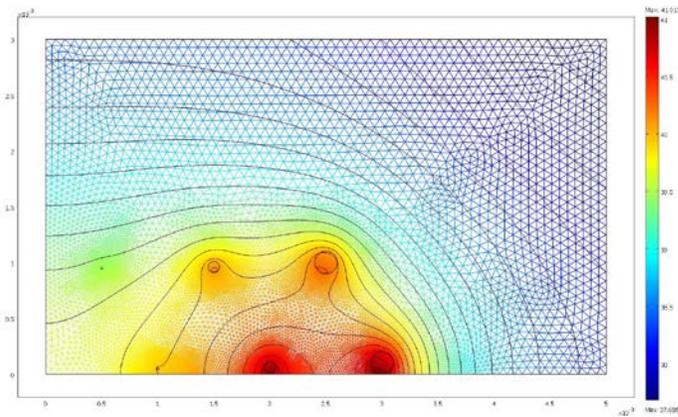
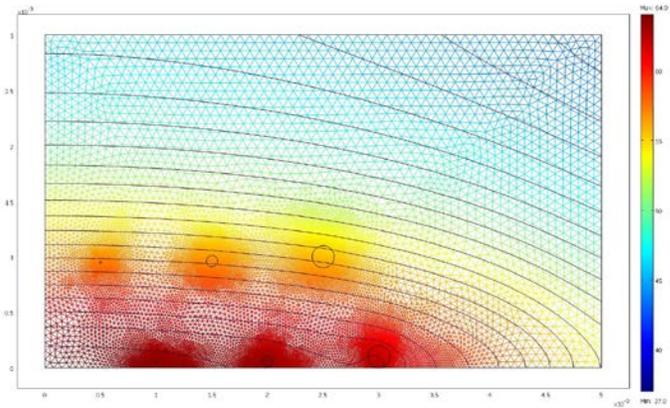
Soggetti partecipanti

- **Light4Tech**
- **Istituto Nazionale di Ottica**
- **Università degli Studi di Firenze**
- **LENS**





Il problema medico: ridurre il sanguinamento durante il trattamento di ringiovanimento laser della pelle.



The device



Patent Application N. PCT/IB2007/054912 (2006)
LED device for the haemostasis of blood vessels
 (Owner: Light4 Tech srl, Inventors: R.Pini, F.Rossi)

A blue-LED-based device for selective photocoagulation of superficial abrasions: theoretical modeling and in vivo validation

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 Domenico Alfieri^f, Giovanni Cannarozzo^g

Photonic Therapeutics and Diagnostics VI, edited by N. Kollias, B. Choi, H. Zeng, R. S. Malek, B. J.-F. Wong, J. F. R. Ilgner,
 K. W. Gregory, G. J. Tearney, L. Marcu, H. H. Cheng, S. J. Madsen, A. Mandelis, A. Mahadevan-Jansen, E. D. Jansen,
 Proc. of SPIE Vol. 7548, 754807 - © 2010 SPIE - CCC code: 1605-7422/10/\$18 - doi: 10.1117/12.841767

Blue LED wins physics Nobel

Invention revolutionized lighting and will reduce global electricity consumption.

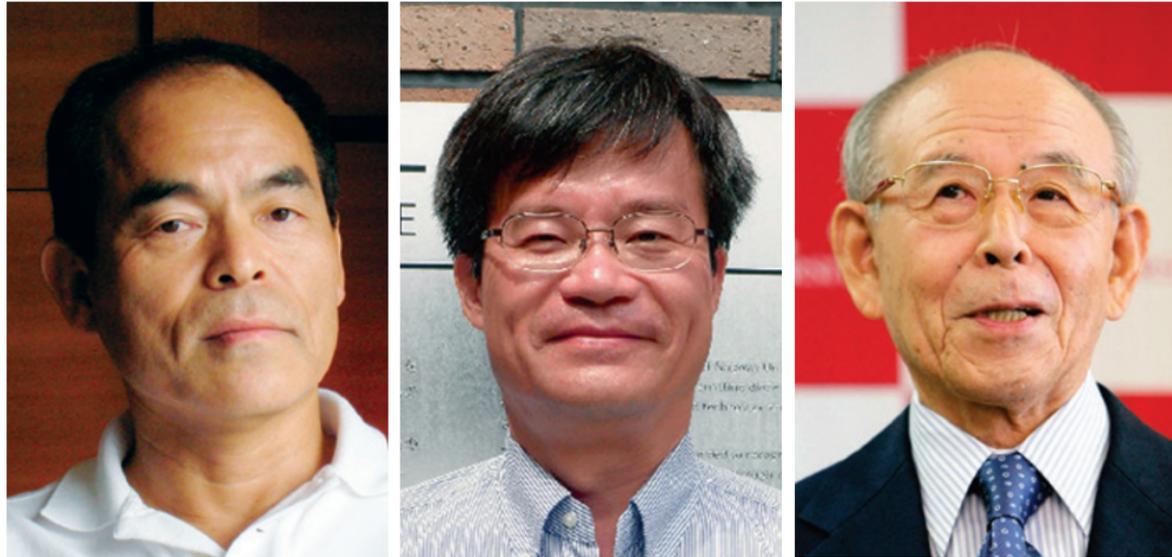
BY ELIZABETH GIBNEY

Found in smartphones, computer screens and energy-efficient bulbs, blue light-emitting diodes (LEDs) are everywhere. That they have now earned three Japanese-born inventors the 2014 Nobel Prize in Physics is a rare example of the award being given for a practical invention.

LEDs are devices that emit light when subjected to an electric current. Green and red versions have been around since the 1950s, but creating blue-emitters was a technical challenge that stumped industry efforts for decades.

It was not until the 1990s that engineers Isamu Akasaki and Hiroshi Amano, both at Japan's Nagoya University, in parallel with electrical engineer Shuji Nakamura, then working at Japanese chemicals firm Nichia, succeeded in creating a blue LED.

LEDs are sandwiches of semiconductor materials. The layers are 'doped' with other elements, which provides some layers with extra electrons and others with a surplus of 'holes',



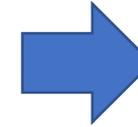
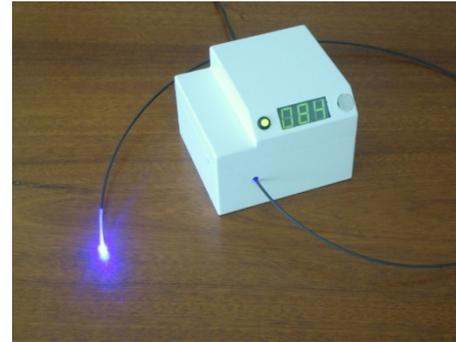
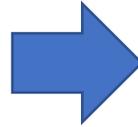
JJI PRESS/AFP/GETTY

Shuji Nakamura, Hiroshi Amano and Isamu Akasaki (left to right) won the 2014 Nobel Prize in Physics.

where missing electrons leave behind a positive charge. When an electrical current is applied, the electrons and holes combine at the junctions between the layers and emit light as a result.

From the 1980s, physicists focused their efforts on the material gallium nitride as a

target for making high-power blue LEDs, but they were faced with several technological hurdles. One was creating thin, high-quality crystals of the material, which are notoriously difficult to grow. Another was doping gallium nitride such that it emitted light efficiently.



Progetto Regionale EMO-LED (2007)

EU FP7 «*Light+Ter*» Project
Grant agreement n°: 232397

EU FP7 & Regione Toscana
ERANET+ *LightPatch*



Regione Toscana
Diritti Valori Innovazione Sostenibilità





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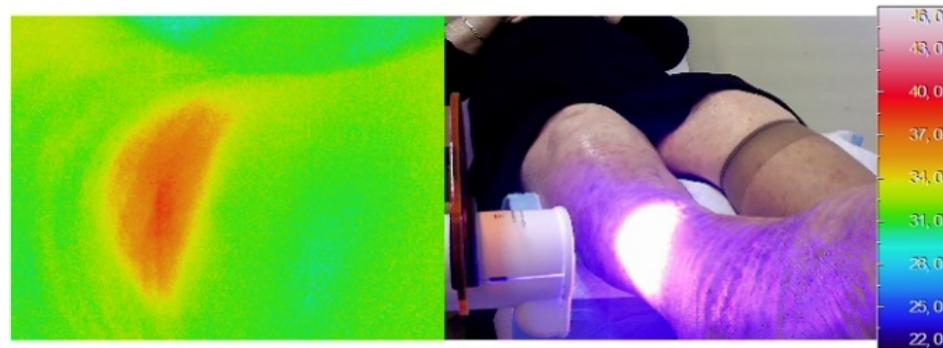
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Ferita cronica: ferita in fase infiammatoria da almeno 8-12 settimane - no guarigione con terapie standard

