



Media Information

## **The innovative BMW laser-light technology receives a 2014 Berthold Leibinger Innovation award. BMW developers awarded the second innovation prize of Berthold Leibinger Foundation.**

**Munich/Ditzingen.** The Berthold Leibinger Foundation awarded Dr. Helmut Erdl and Dr. Abdelmalek Hanafi of BMW Group the second innovation prize. The award recognizes the candidates for the development and implementation of a new high-brightness white light source that enhances the visibility of vehicle drivers. On June 5th, the BMW i8 with laser-based lighting systems were delivered to customers.

"We are honored to receive this prize that represents the second best laser applications worldwide during the last two years out of 32 applications according to a jury composed of top scientists and industrials. The competition was extremely hard." said Erdl and Hanafi. "Our innovation is indeed a game changer not only in the automotive lighting sector, but in the illumination sector in general." commented Erdl and Hanafi. "This prize is actually a tribute to the whole automotive sector as well as to the entire contributors to the advances in GaN-based solid state lighting" added Erdl and Hanafi.

Dr. Alexander A. Oraevsky of Tomo Wave Laboratories Inc. USA is the 2014 first innovation prize winner in recognition of his important work on laser opto-acoustic imaging applied to cancer diagnosis purposes. Prof. Hwa-yaw Tam, Prof. Siu Lau Ho and Dr. Shun-Yee Michael Liu of the Hong Kong Polytechnic University are the third innovation prize winners for a laser-sensor network for monitoring railway traffic.

The Berthold Leibinger Innovation Prize has been awarded every two years since 2002 for outstanding achievement in the development of forward-looking laser-light applications. The Berthold Leibinger Innovation Prize award recognizes and promotes researchers and developers, who take new directions in the application of lasers. The foundation has been awarding the prize every two years since 2000 for excellent research and development work in the application or generation of laser light. It is one of the most prestigious international innovation awards for laser technology. The jury of 11 judges is made up of internationally acclaimed scientists and leading managers of technology corporations. <http://www.leibinger-stiftung.de/de/foerderaktivitaeten/laser-forschungs-innovationspreis/innovationspreis.html>

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Further information on official fuel consumption figures, specific CO<sub>2</sub> emission values and the electric power consumption of new passenger cars are included in the following guideline: "Leitfaden über Kraftstoffverbrauch, die CO<sub>2</sub>-Emissionen und den Stromverbrauch neuer Personenkraftwagen" (Guideline for fuel consumption, CO<sub>2</sub> emissions and electric power consumption of new passenger cars), which can be obtained from all dealerships, from the Deutsche Automobil Treuhand GmbH (DAT), Hellmuth-Hirth-Str. 1, 73760 Ostfildern-Scharnhausen and at <http://www.dat.de/angebote/verlagsprodukte/leitfaden-kraftstoffverbrauch.html>. LeitfadenCO<sub>2</sub> (Guideline CO<sub>2</sub>) (PDF – 2.7 MB)

### **Biography of Dr. Helmut Erdl:**

Dr. Helmut Erdl is a senior industrial physicist with over 25 years' professional experience in optical engineering.

He graduated in physics from the Technical University of Munich in 1990 and obtained his doctorate in 1995 at the Ludwig Maximilian University in Munich. In 1990 he started working at the Max Planck Institute for Astrophysics in Garching on the classification of gravitation lenses and the study of the nonlinear characteristics of such phenomena based on catastrophe theory. In 1995, he began a postdoctoral fellowship in the R&D department of Carl Zeiss AG in Oberkochen, Germany. There, he worked on in-situ IR laser scanning mammography and real-time applications for laser measurement of emission concentrations in exhaust gases. After completing the postdoctoral fellowship, he joined the mathematics department of Carl Zeiss AG, where he was involved in the development of ray-tracing software, stray-light analysis for intersatellite communication systems and tolerance analysis of lithography lenses for semiconductor systems. In 2001, he joined the automotive lighting department of the BMW Group. There, he initially worked on the subject of pixel-based lighting systems before concentrating on the development of new light systems based on optical fibers for headlights, rear lights and interior lights. That opened the door to an innovative lighting project that led to the development of the BMW corona rings, from parking lights through daytime running lights to dipped headlights. In 2009/2010, he and Dr. Hanafi began their investigations into laser systems for automotive lighting, which culminated in the market launch in 2014 of the first laser-based headlights in the BMW i8.

Dr. Erdl holds more than 30 patent families.



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### **Biography of Dr. Abdelmalek Hanafi:**

Dr. Abdelmalek Hanafi is a senior industrial physicist with over 15 year experience in optical engineering and photonics.

Between 1988 and 1990, he attended the Mathématiques Supérieures & Spéciales program with focus on Physics and Chemistry at Lycée Louis Thuillier/ University of Picardie in Amiens, France. He received his “Diplôme des Études Approfondies” degree in applied physics from the University of Franche-Comté (École Nationale Supérieure des Microtechniques) in Besançon, France in 1993. He received his Ph.D. degree with honor from the University of Franche-Comté and Centre National de Recherche Scientifique (Institut des Microtechniques/ Laboratoire d'Optique Pierre-Michel Duffieux) in 1999. His doctoral studies focused on Interferometry and Profilometry applied to turbid living medium. His collaborations with different research groups include: gyroscopes based on Sagnac-interferometer, feedback in DFB semiconductor lasers and fluorescence microscopy namely for Calcium concentration measurements in heart cells.

In 2000, he joined Photonami Inc., Toronto, Canada, as an optical scientist to develop new optical burst switching routers for intelligent DWDM optical fiber network in the telecommunication field. Thereafter, he worked on the development of optical amplifiers based on Er:ZnO quantum dots. In 2005, he joined the automotive lighting department of BMW Group, Munich, Germany, and was involved in the optical design, simulation and development of innovative LED-based illumination systems for exterior lighting. In 2008, he joined the defense business unit of the Qioptiq Group's Munich division (formerly Linos Photonics GmbH, and Rodenstock Precision Optics GmbH) as project manager in charge of the R&D, pre-development and innovations within the business unit. His area of activities involved new types of Head-Up Display, such as laser projection HUD, but also Head-Mounted Displays and Night-Vision systems. In 2010, he returned to the automotive lighting department of BMW Group to start his work with Dr. Helmut Erdl on laser-based white light source for Vehicular Lighting Systems. He has (co)authored 7 scientific papers and holds 7 patent families. He is a member of the Optical Society of America and the Society of Information Display.



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### **The jury of the Leibinger Prize award 2014:**

Stephen Anderson

Industry & Market Strategist, SPIE-The international society for optics and photonics

Prof. Dr. med. Hans-Peter Berlien

Chief Physician of the Laser Medical Department, Elisabeth Hospital Berlin

Dr. Hermann Gerlinger

Member of the Executive Board of Carl Zeiss Group, President and CEO of Carl Zeiss SMT GmbH

Prof. Dr. Theodor Hänsch

Max Planck Institute for Quantum Optics / Ludwig-Maximilians-Universität Munich

Prof. Dr. Henning Kagermann

President of acatech - National Academy of Science and Engineering

Prof. Dr. Ursula Keller

Swiss Federal Institute of Technology Zurich, Institute for Quantum Electronics

Prof. Dr. Wolfgang Marquardt

RWTH Aachen, Aachener Verfahrenstechnik

Prof. Dr. med. John Stuart Nelson

Medical Director of the Beckmann Laser Institute

Prof. Dr. Orazio Svelto

Politecnico di Milano, Department of Physics

Prof. Dr.-Ing. Hans-Jürgen Warnecke

Fraunhofer Institute for Manufacturing Engineering and Automation

Prof. Dr. -Ing. Michael Zäh

Technische Universität München, Institute for Machine Tools and Industrial Management



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### **The BMW Group**

With its three brands BMW, MINI and Rolls-Royce, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. As a global company, the BMW Group operates 29 production and assembly facilities in 14 countries and has a global sales network in more than 140 countries.

In 2013, the BMW Group sold approximately 1.963 million cars and 115,215 motorcycles worldwide. The profit before tax for the financial year 2013 was € 7.91 billion on revenues amounting to approximately € 76.06 billion. As of 31 December 2013, the BMW Group had a workforce of 110,351 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy.

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