



PRESS RELEASE

2. Prize – Professor Dr. Andreas Tünnermann,
Dr. Stefan Nolte und Dr. Holger Zellmer
Friedrich-Schiller-University / Fraunhofer-
Institute for Applied Optics and Precision
Engineering, both in Jena, Germany

"High Power Lasers and their Applications"

The high-power laser is a step towards developing simple, compact and robust lasers with high beam quality. The properties of the fiber laser model inspire developers and engineers to create new applications, from basic research over laser material processing to biophotonics. Prof. Andreas Dr. Tünnermann, Dr. Stefan Nolte and Dr. Holger Zellmer get the second prize of the Berthold Leibinger Innovationspreis 2004 for pioneering work in this field.

Standard laser resonators consist of a variety of optical elements which generate, conduct and manipulate the laser light. Fiber lasers, on the other hand, consist of only one special glass fiber, which can accomplish all the important tasks: it generates and conducts the laser light. The principle is very simple: as the energy source for the laser light, pump light is coupled into one end of a special fiber. The laser beam exits at the other end.

The advantages of the fiber laser are readily apparent. Having a length of several meters, the fiber affords efficient and uniform cooling; due to the narrow light conduction, the result is excellent beam quality. However, the first fiber lasers introduced in the 1960s had a starting output of only a few milliwatts. Fiber amplifiers in communication networks in the 1990s were their first important application. They amplified the light signals within the fiber glass cables. Only with the appearance of recent advances in fiber and waveguide optics are the outputs in generating light in fibers no longer limited to low power.

On these grounds, Professor Andreas Dr. Tünnermann, Dr. Stefan Nolte and Dr. Holger Zellmer have developed innovative fiber laser designs – first at the Laser Zentrum Hannover, Germany and then at the Friedrich Schiller University and the Fraunhofer Institute for Applied Optics and Precision Engineering, both in Jena, Germany.



They were able to generate both high continual outputs as well as ultrashort pulses with very high beam quality. For the functionality of glass fiber as a laser medium, its very special design is important. As simple as the setup of the fiber laser is, the composition of the fiber itself is complex. These three scientists have performed important pioneering work in this field.

Digital pictures of the prize winners and the awarded work are available at www.leibinger-stiftung.de.