

**Rare-Earth Doping  
of Advanced Materials  
for Photonic Applications—2011**

**MATERIALS RESEARCH SOCIETY  
SYMPOSIUM PROCEEDINGS VOLUME 1342**

# **Rare-Earth Doping of Advanced Materials for Photonic Applications—2011**

Symposium held April 25–29, 2011, San Francisco, California, U.S.A.

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Materials Research Society  
Warrendale, Pennsylvania



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Singapore, São Paulo, Delhi, Tokyo, Mexico City

Cambridge University Press

32 Avenue of the Americas, New York, NY 10013-2473, USA

[www.cambridge.org](http://www.cambridge.org)

Information on this title: [www.cambridge.org/9781605113197](http://www.cambridge.org/9781605113197)

Materials Research Society

506 Keystone Drive, Warrendale, PA 15086, USA

<http://www.mrs.org>

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First published 2012

CODEN: MRSPDH

ISBN: 978-1-60511-319-7 Hardback

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\*Invited Paper

## PREFACE

Symposium V “Rare Earth Doping of Advanced Materials for Photonic Applications” took place during the 2011 Spring Meeting of the Materials Research Society in San Francisco, California from April 25–29, 2011. The scientists who attended the symposium came from 14 different countries around the world. The conference program had 10 invited talks, 37 oral communications, 20 posters and several short presentations from poster authors. This special symposium proceeding, also available in Online Proceedings Library (OPL) hosted on Cambridge Journals Online (CJO), contains 17 papers, including the invited talks as well as selected oral and poster contributions.

Symposium V successfully fulfilled the organizers aim to bring together researchers from a number of fields that traditionally do not interact closely with each other although their general theme of rare earth doping and using the functionality that these ions offer is common to all of them. The symposium provided to the semi-conductor, phosphors and device communities a unique opportunity to discuss the fundamental topics of common interest that underlie the emission in rare-earth-doped materials. Such a mix of different research topics, silicon photonics, phosphors, oxides, and wide band gap materials including III-nitride semiconductors, to name a few, greatly promotes a healthy and vigorous exchange of ideas.

The goal of this symposium was to highlight the status of light emission at infrared and visible wavelengths from rare-earth-doped phosphors as well as semiconductors. The symposium addressed topics from basic to application-driven research. The overlap of the different areas is very apparent in the discussion about the way rare earth ions can get excited most efficiently and how they can transfer their excitation. Progress has been reported in generating and understanding luminescence from rare earth ions sensitized by nanoclusters in different materials. The demonstration of the efficient electroluminescence in Europium-doped GaN light-emitting diodes at room-temperature has proven the practicality of using this material as a technological contender for optoelectronics. Furthermore, issues of rare earth materials applications for green technologies, sustainability and opportunities for development of multifunctional devices utilizing magnetic, electric and pressure stimuli were addressed in the symposium.

The editors would like to thank the authors of the manuscripts. MRS meetings have become one of the most important forums for rare earth doped materials and applications. The challenges in fundamental issues of generating light in ultraviolet, visible and near infrared spectral regions have a great impact not only on the rare earth ions research community but also on the general fields of photonics and optoelectronics. This volume is a useful resource to share interests within this broad research community.

Volkmar Dierolf  
Yasufumi Fujiwara  
Tom Gregorkiewicz  
Wojciech M. Jadwisieniczak

August 2011

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