# Electronics, Magnetics and Photonics

# MRS Advances: Electronics, Magnetics and Photonics

### **Associate Editor:**

Jeremy Theil, Mountain View Energy

### **Principal Editors:**

Jeff McCallum, University of Melbourne Franck Natali, Victoria University of Wellington Takao Someya, The University of Tokyo

Yifei Sun, Purdue University Martin Kuball, University of Bristol

### MRS Advances Editorial Board:

Editor-in-Chief: David F. Bahr, Purdue University Asa Barber, University of Portsmouth, United Kingdom Meenakshi Dutt, Rutgers University Elizabeth L. Fleischer, Materials Research Society

Marian Kennedy, Clemson University Marilyn L. Minus, Northeastern University Roger J. Narayan, University of North Carolina/North Carolina State University Jeremy Theil, Mountain View Energy

# Materials Research Society Editorial Office, Warrendale, PA:

Ellen W. Kracht, Publications Manager Susan Dittrich, Journals Editorial Assistant Kirby L. Morris, Journals Production Assistant Eileen M. Kiley, Director of Communications

### Disclaimer

Authors of each article appearing in this Journal are solely responsible for all contents in their article(s) including accuracy of the facts, statements, and citing resources. Facts and opinions are solely the personal statements of the respective authors and do not necessarily represent the views of the editors, the Materials Research Society, or Cambridge University Press.

MRS Advances (EISSN: 2059-8521) is published by Cambridge University Press, One Liberty Plaza, Floor 20, New York, NY 10006 for the Materials Research Society.

Copyright © 2017, Materials Research Society. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying, or otherwise, without permission in writing from Cambridge University Press. Policies, request forms and contacts are available at: http://www.cambridge.org/rights/permissions/permission.htm. Permission to copy (for users in the USA) is available from Copyright Clearance Center at: http://www.copyright.com, email: info@copyright.com.

email: info@copyright.com.

Purchasing Options:

Premium Subscription- Premium Subscription includes current subscription and one year's lease access to the full MRS Online Proceedings Library Archive for \$7,219.00 / £4,888.00 / £6,647.00. Subscription-Subscription with perpetual access to the content subscribed to in a given year, including three years of back-file lease access to content from the MRS Online Proceedings Library Archive. The price for a 2017 subscription is \$3,019.00 / £1,948.00 / €2,625.00. MRS Members- Access to MRS Advances is available to all MRS members without charge.

## EContact Details:

For all inquiries about pricing and access to MRS Advances, please get in touch via the following gemail addresses: online@cambridge.org (for the Americas); library.sales@cambridge.org (for UK, Europe, and rest of world).

https://doi.org/10.1557/adv.2017.26

# **CONTENTS**

Effects of Sputtering Gas Pressure Dependence of Surface  Morphology of ZnO Films Fabricated Via Nitrogen Mediated	_
Crystallization	5
Structural and Optical Properties of Al <sub>0.30</sub> Ga <sub>0.70</sub> N/AlN Multiple Quantum Wells Grown on Vicinal 4H p-SiC Substrates by Molecular Beam Epitaxy	1
Blue Photoluminescence of (ZnO) <sub>0.92</sub> (InN) <sub>0.08</sub>	7
Optical Properties of Germanium Doped Cubic GaN	3
Hot Filament CVD Epitaxy of 3C-SiC on 6H and 3C-SiC Substrates	9
Development of a New Electrochemical Method for Preparation of Titanium Dioxides Films from an Aqueous Solution	5
Corundum-structured α-In <sub>2</sub> O <sub>3</sub> as a Wide-Bandgap Semiconductor for Electrical Devices	1

Hydrogen Passivation of Vacancies in Diamond: Electronic Structure and Stability from ab Initio Calculations
Pulsed Laser Deposition of Epitaxial ZnS <sub>x</sub> Se <sub>1-x</sub> Thin Films for Waveguiding Applications in Mid-IR Active Multilayered Structures
Vladimir V. Fedorov, Sergey B. Mirov, and Renato P. Camata  Temperature-dependent Optical Properties of AlN Thin Films by Spectroscopy Ellipsometry
Yao Liu, Ehsan Ghafari, Xiaodong Jiang, Yining Feng, Zhe Chuan Feng, Ian Ferguson, and Na Lu
Epitaxial Growth of InAlN/GaN Heterostructures on Silicon Substrates in a Single Wafer Rotating Disk MOCVD Reactor