

MRS **Advances**

# Nanomaterials

<https://doi.org/10.1557/adv.2017.163> Published online by Cambridge University Press

# MRS Advances: Nanomaterials

## Associate Editor:

Marilyn L. Minus, *Northeastern University*

## Principal Editors:

Hannah Joyce, *University of Cambridge*  
Andrew Wee, *National University of Singapore*  
Ranjit Pati, *Michigan Technological University*  
Don Futaba, *AIST*

Gang Xiong, *First Solar, Inc.*  
Yongfeng Mei, *Fudan University*  
Georgios Sotiriou, *ETH Zurich*

## 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](mailto: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.

## Contact Details:

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

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

# CONTENTS

<b>High Resolution Piezoresponse Force Microscopy Study of Self-assembled Peptide Nanotubes. . . . .</b>	<b>63</b>
Maxim Ivanov, Ohheum Bak, Svitlana Kopyl, Semen Vasilev, Pavel Zelenovskiy, Vladimir Shur, Alexei Gruverman, and Andrei Kholkin	
<b>Highly Conductive Wire: Cu Carbon Nanotube Composite Ampacity and Metallic CNT Buckypaper Conductivity . . . . .</b>	<b>71</b>
Henry C. de Groh III	
<b>Optical Properties of Vertically Aligned Graphene Sheets. . . . .</b>	<b>77</b>
Takatoshi Yamada, Makoto Hisa, and Masataka Hasegawa	
<b>Electronically Pure Single Chirality Semiconducting Single-walled Carbon Nanotube for Large Scale Electronic Devices . . . . .</b>	<b>83</b>
Huaping Li	
<b>Effects of Al<sub>2</sub>O<sub>3</sub> Type on Activity of Al<sub>2</sub>O<sub>3</sub>-supported Rh Catalysts in Single-walled Carbon Nanotubes Growth by CVD. . . . .</b>	<b>89</b>
Hoshimitsu Kiribayashi, Takayuki Fujii, Takahiro Saida, Shigeya Naritsuka, and Takahiro Maruyama	
<b>Electronic Transport in Oxidized Zigzag Graphene Nanoribbons . . . .</b>	<b>97</b>
Venkata Sai Pavan Choudary Kollu, Vipin Kumar, Shobha Shukla, and Sumit Saxena	
<b>Characterization of Graphene Gate Electrodes for Metal-oxide-semiconductor Devices . . . . .</b>	<b>103</b>
Yanbin An, Aniruddh Shekhawat, Ashkan Behnam, Eric Pop, and Ant Ural	
<b>Selective Growth of Semiconducting Single-walled Carbon Nanotubes by “In Situ” Methods . . . . .</b>	<b>109</b>
Chengzhi Luo and Chunxu Pan	

<b>Graphene Films Prepared Using Energetic Physical Vapor Deposition . . . . .</b>	<b>117</b>
Daniel T. Oldfield, Chi P. Huynh, Stephen C. Hawkins, and Dougal G. McCulloch	
<b>Permeation of Water Nanodroplets on Carbon Nanotubes Forests . . . .</b>	<b>123</b>
Ygor M. Jaques and Douglas S. Galvao	
<b>Mechanical and Thermal Stability of Graphyne and Graphdiyne Nanoscrolls . . . . .</b>	<b>129</b>
Daniel Solis, Cristiano F. Woellner, Daiane D. Borges, and Douglas S. Galvao	