



# MRS Communications

VOLUME 8 • NO 1, 2018

A publication of the

**MRS** MATERIALS RESEARCH SOCIETY  
*Advancing materials. Improving the quality of life.*

**CAMBRIDGE**  
UNIVERSITY PRESS

# MRS COMMUNICATIONS

*MRS Communications* is a high-impact archival journal focusing on rigorous peer review and rapid publication of completed research with broad appeal to the materials community. Major article types include rapid communications (research letters), "prospectives" papers, correspondence and commentaries.

"Prospectives" are a unique feature of this Journal offering succinct and forward-looking reviews of topics of interest to a broad materials research readership. This modern journal features advanced on-line publication, in full color, acceptance of supplemental materials, and multimedia content. *MRS Communications* leverages the deep technical expertise of leading MRS members among its editorial board and reviewers under the governance of a team of Principal Editors, and the advanced author and reader publication services and academic standing offered by Cambridge Journals.

Manuscript submissions that succinctly describe groundbreaking work in the broad field of materials research are encouraged. Examples of leading topical areas of interest to *MRS Communications* readers include:

- Biomaterials and biomimetic materials
- Carbon-based materials
- Complex oxides and their interfaces
- Materials for energy storage, conversion and environmental remediation
- Materials for nanophotonics and plasmonic devices
- Theory and simulation of materials
- Mechanical behavior at the nanoscale
- Nanocrystal growth, structures and properties, including nanowires and nanotubes
- Nanoscale semiconductors for new electronic and photonic applications
- New materials synthesis, templating and assembly methods
- New topics in metals, alloys and transformations
- Novel and *in-situ* characterization methods
- Novel catalysts and sensor materials
- Organic and hybrid functional materials
- Quantum matter
- Surface, interface and length-scale effects on materials properties

## Author queries and submissions

*MRS Communications* operates a fully online author submission and peer review system, which can be found at <http://mc.manuscriptcentral.com/mrscom>

For questions related to *MRS Communications*, please contact [mrc@mrs.org](mailto:mrc@mrs.org)

## MRS Communications Article Types

### Prospectives

Forward-looking short reviews. Authoritative and balanced, but can deal with controversies or new and speculative areas of research for future consideration.

Technical Description:

- Generally invited, although unsolicited short proposals will be reviewed by editorial team
- 7000-8000 words, 8-10 printed pages
- Multiple illustrations and figures encouraged
- Supplemental and multimedia data encouraged
- Max. 100 references

### Research Letters

A concise presentation of a study with broad interest, showing novel results.

Technical Description:

- 6000 word maximum, 6-8 printed pages
- Each figure or figure part is counted as 250 words
- Short 100 word abstract
- Max. 30 references
- Supplemental data encouraged

### Editorials

Opinion piece, policy statement, or general commentary, typically written by board of the publication or a guest of notable stature.

Technical Description:

- Generally written or invited by editorial team
- 500-1500 words, 1-3 printed pages
- Max. 15 references
- No supplemental data

### Commentaries

An item whose subject or focus is another article or articles; this article comments on the other article(s).

Technical Description:

- Generally invited by editorial team, although unsolicited commentaries may be reviewed
- Accessible and non-technical style
- 500-1500 words, 1-3 printed pages
- 1 fig or illustration
- Max. 15 references
- No supplemental data

### Correspondence

Letter to the editor/publication, typically commenting upon a published item.

Technical Description:

- Flexible format of general interest to readership—policy debates, announcements or matters arising from published material
- 500-1000 words, 1-2 printed pages
- 1 fig or illustration
- Max. 10 references
- Supplemental data at editor discretion
- If critical of a previously published paper, original author will be given option to publish a reply (no automatic right to reply)

**Copyright © 2018**, 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 U.S.A.) is available from Copyright Clearance Center <http://www.copyright.com>, email: [info@copyright.com](mailto:info@copyright.com).

### MRS Communications Subscription Prices (2018)

#### Institutions

Online only  
\$828.00 / £517.00

Print-on-Demand available to online subscribers.

Inquire Customer Services.

*MRS Communications* (ISSN: 2159-6859) is published four times a year by Cambridge University Press for the Materials Research Society.

**Individual member subscriptions are for personal use only.**

# MRS Communications

**Editor-in-Chief:** Rigoberto Advincula, *Case Western Reserve University, USA*

## **Principal Editors**

Luca Dal Negro, *Boston University, USA*

Andrew M. Minor, *University of California, Berkeley and Lawrence Berkeley National Laboratory, USA*

Róisín Owens, *Ecole Nationale Supérieure des Mines de Saint-Étienne, France*

Alberto Salleo, *Stanford University, USA*

Alec Talin, *Sandia National Laboratory, USA*

Nagarajan (Nagy) Valanoor, *The University of New South Wales, Australia*

## **MRS Communications Advisory Board**

Jodie Bradby, *The Australian National University, Australia*

Horacio Espinosa, *Northwestern University, USA*

A. Lindsay Greer, *Cambridge University, United Kingdom*

Supratik Guha, *IBM Research, USA*

Howard E. Katz, *Johns Hopkins University, USA*

Nicholas A. Kotov, *University of Michigan, USA*

George Malliaras, *École Nationale Supérieure des Mines, France*

Tobin Marks, *Northwestern University, USA*

Linda F. Nazar, *University of Waterloo, Canada*

Ramamoorthy Ramesh, *University of California, Berkeley, USA*

Henning Riechert, *Paul Drude Institut für Festkörperelektronik, Germany*

Thomas P. Russell, *University of Massachusetts, USA*

Darrel G. Schlom, *Cornell University, USA*

James S. Speck, *University of California, Santa Barbara, USA*

Katsuyo Thornton, *University of Michigan, USA*

## **Editorial Office:**

Ellen W. Kracht, *Publications Manager, Materials Research Society, Warrendale, PA*

Linda A. Baker, *Editorial Assistant, Materials Research Society, Warrendale, PA*

Kirby L. Morris, *Production Assistant, Materials Research Society, Warrendale, PA*

Eileen M. Kiley, *Director of Communications, Materials Research Society, Warrendale, PA*



# MRS Communications

Volume 8, Number 1, March 2018

## Prospective Articles

- |       |   |  |
|-------|---|--|
| 1–14  | <b>Paper as a scaffold for cell cultures: Teaching an old material new tricks</b> | Xinchen Wu, Sanika Suvarnapathaki, Kierra Walsh, Gulden Camci-Unal |
| 15–28 | <b>Temperature-dependent nanoindentation response of materials</b>                | Saeed Zare Chavoshi, Shuozhi Xu                                    |

## Commentaries

- |       |  |              |
|-------|--|--------------|
| 29–34 | <b>Water photonics, non-linearity, and anomalously large electro-optic coefficients in poled silica fibers</b> | John Canning |
|-------|--|--------------|

## Research Letters

- |         |  |   |
|---------|--|---|
| 35–39   | <b>Colon cancer cells adhesion on polymeric nanostructured surfaces</b>  | Angelo Accardo, Victoria Shalabaeva, Rosanna La Rocca   |
| 40–48   | <b>Metal organic framework-modified nitrogen-doped graphene oxygen reduction reaction catalyst synthesized by nanoscale high-energy wet ball-milling structural and electrochemical characterization</b> | Shiqiang Zhuang, Bharath Babu Nunna, Eon Soo Lee  |
| 49–58   | <b>Nanostructured substrates for multi-cue investigations of single cells</b>  | Joseph A. Christodoulides, Marc Christophersen, Jinny L. Liu, James B. Delehanty, Deepa Raghu, Michael Robitaille, Jeff M. Byers, Marc P. Raphael |
| 59–64   | <b>Synthesis of nanosized zirconium dioxide and its solid solutions with titanium dioxide from the CO<sub>2</sub> supercritical fluid</b>  | I.E. Sokolov, I.A. Konovalov, R.M. Zakalyukin, D.V. Golubev, A.S. Kumskov, V.V. Fomichev  |
| 65–70   | <b>Effect of the spacer arm on non-specific binding in membrane affinity chromatography</b>  | Eleonora Lalli, Giulio C. Sarti, Cristiana Boi  |
| 71–78   | <b>Rapid microwave synthesis and optical activity of highly crystalline platinum nanocubes</b>   | Clare Davis-Wheeler Chin, Sara Akbarian-Tefaghi, Juana Reconco-Ramirez, John B. Wiley   |
| 79–87   | <b>Self-patterning of graphene-encapsulated gold nanoparticles for surface-enhanced Raman spectroscopy</b>   | Yuan Li, Kelly Burnham, John Dykes, Nitin Chopra  |
| 88–94   | <b>Fabrication of nickel and nickel carbide thin films by pulsed chemical vapor deposition</b>   | Qun Guo, Zheng Guo, Jianmin Shi, Lijun Sang, Bo Gao, Qiang Chen, Zhongwei Liu, Xinwei Wang  |
| 95–99   | <b>Silver nanostructures evolution in porous SiO<sub>2</sub>/p-Si matrices for wide wavelength surface-enhanced Raman scattering applications</b>  | Dmitry Yakimchuk, Egor Kaniukov, Victoria Bundyukova, Liubov Osminkina, Steffen Teichert, Sergey Demyanov, Vladimir Sivakov                       |
| 100–106 | <b>Synthetic biology with nanomaterials</b>  | Sanhita Ray, Ahana Mukherjee, Pritha Chatterjee, Kaushik Chakraborty, Anjan Kr Dasgupta   |

- 107–112 **Surface plasmon resonance-enhanced photoelectrochemical sensor for detection of an organophosphate pesticide chlorpyrifos** Treenet Thepudom, Chutiparn Lertvachirapaiboon, Kazunari Shinbo, Keizo Kato, Futao Kaneko, Teerakiat Kerdcharoen, Akira Baba
- 113–121 **Investigation of the phase equilibria at 773 K and metallic glass regions in the Ag–Al–Zr ternary system** Hsien-Ming Hsiao, Yung-Chin Lan, Gita Novian Hermana, Hao Chen, Yee-Wen Yen
- 122–126 **Oxoammonium cation of 2,2,6,6-tetramethylpiperidin-1-oxyl: a very efficient dopant for hole-transporting triaryl amines in a perovskite solar cell** H. Maruo, S. Tanaka, M. Takamura, K. Oyaizu, H. Segawa, H. Nishide
- 127–131 **Laser-assisted spalling of large-area semiconductor and solid state substrates** Felix Kaule, Marko Swoboda, Christian Beyer, Ralf Rieske, Anas Ajaj, Wolfram D. Drescher, Stephan Schoenfelder, Jan Richter
- 132–136 **Focused ion beam characterization of deformation resulting from nanoindentation of nanoporous gold** Nicolas J. Briot, T. John Balk
- 137–144 **Incorporation of graphene quantum dots to enhance photocatalytic properties of anatase TiO<sub>2</sub>** Sowbaranigha Chinnusamy, Ravneet Kaur, Anuja Bokare, Folarin Erogbogbo
- 145–151 **Determination of adsorption-controlled growth windows of chalcogenide perovskites** Stephen A. Filippone, Yi-Yang Sun, R. Jaramillo
- 152–159 **Surface modification of microporous carbonaceous fiber for the growth of zinc oxide micro/nanostructures for the decontamination of malathion** Ashitha Gopinath, Krishna Kadirvelu
- 160–167 **A non-noble Cr–Ni-based catalyst for the oxygen reduction reaction in alkaline polymer electrolyte fuel cells** P. Faubert, I. Kondov, D. Qazzazie, O. Yurchenko, C. Müller
- 168–177 **Polypropylene films modified by grafting-from of ethylene glycol dimethacrylate/glycidyl methacrylate using  $\gamma$ -rays and antimicrobial biofunctionalization by Schiff bases** G.G. Flores-Rojas, F. López-Saucedo, J.E. López-Barriguete, T. Isoshima, M. Luna-Straffon, E. Bucio
- 178–182 **Mechanical finishing and ion beams application to cold working tool steels: consequences for scratch resistance** Witold Brostow, Sven Lohse, Allison T. Osmanson, Daniel Tobola, Duncan L. Weathers
- 183–188 **Insulator–metal transition and the hopping transport in epitaxial Sm<sub>0.6</sub>Nd<sub>0.4</sub>NiO<sub>3</sub> thin films** Badr Torriss, Joëlle Margot, Mohamed Chaker
- 189–193 **Carbon-chain inserting effect on electronic behavior of single-walled carbon nanotubes: a density functional theory study** Hao Cui, Qingjuan Li, Guibao Qiu, Jian Wang
- 194–198 **Enhancement transmittance of a metamaterial filter based on local surface plasma resonance** Chao Chen, Fei Wang, Yuping Sheng, Jun Wang
- 199–206 **Grafting of glycerol methacrylate onto silicone rubber using  $\gamma$ -rays: derivatization to 2-oxoethyl methacrylate and immobilization of lysozyme** G.G. Flores-Rojas, F. López-Saucedo, M. Quezada-Miriél, E. Bucio