

MRS

Advances

# Mechanical Behavior and Failure Mechanisms of Materials

<https://doi.org/10.1557/adv.2017.418> Published online by Cambridge University Press

MRS

MATERIALS  
RESEARCH  
SOCIETY®

CAMBRIDGE  
UNIVERSITY PRESS

# MRS Advances: Mechanical Behavior and Failure Mechanisms of Materials

## Associate Editor:

Marian Kennedy, *Clemson University*

## Principal Editors:

John J. Lewandowski, *Case Western Reserve University*

Timothy J. Rupert, *University of California, Irvine*

## 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>Evaluation of Microstructure Formation and Phase Equilibria for Thermoelectric <math>\beta</math>-FeSi<sub>2</sub> Composite Alloys . . . . .</b>	<b>1369</b>
Yoshisato Kimura, Hiroaki Otani, Ayaka Mori, and Yaw-Wang Chai	
<b>Solid State Manufacture of High Entropy Alloys-preliminary Studies . . . . .</b>	<b>1375</b>
M.B.D. Ellis and G.R. Doughty	
<b>Processing Parameter, Microstructure and Hardness of Ni Base Intermetallic Alloy Coating Fabricated by Laser Cladding . . . . .</b>	<b>1381</b>
Takeshi Okuno, Yasuyuki Kaneno, Takuto Yamaguchi, Takayuki Takasugi, Satoshi Semboshi, and Hideki Hagino	
<b>Porous Ti–Al Intermetallic Based Alloys Fabricated by Pressure-sintering Elemental Powders with a Space Holder Powder . . . . .</b>	<b>1387</b>
Naoki Takata, Keisuke Uematsu, and Makoto Kobashi	
<b>Chemically Graded Fe–Al/steel Samples Fabricated by Laser Metal Deposition . . . . .</b>	<b>1393</b>
Saeid Lotfian, Gesa Rolink, Andreas Weisheit, and Martin Palm	
<b>Ordering and Disordering of <math>\beta/\beta_0</math>-phase in <math>\gamma</math>-TiAl Based Alloys Investigated by Neutron Diffraction . . . . .</b>	<b>1399</b>
Victoria Kononikhina, Andreas Stark, Weimin Gan, Andreas Schreyer, and Florian Pyczak	
<b>The Evaluation of The Composition Dependence of Fracture Toughness of Al<sub>3</sub>Nb Alloys by Using Micro-size Fracture Testing . . . . .</b>	<b>1405</b>
Nobuhiro Matsuzaki, Ken-ichi Ikeda, Seiji Miura, Nobuaki Sekido, and Takahito Ohmura	

**Deformation of Biomedical AuCuAl-based Shape Memory Alloy Micropillars. . . . . 1411**  
Akira Umise, Rui Serizawa, Sari Yanagida,  
Kenji Goto, Masaki Tahara, Tso Fu Mark Chang,  
Tomonari Inamura, Masato Sone,  
and Hideki Hosoda