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978-1-107-40829-6 - Materials and Physics for Nonvolatile Memories: Materials Research Society
Symposium Proceedings: Volume 1160

Editors: Yoshihisa Fujisaki, Rainer Waser, Tingkai Li and Caroline Bonafos

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**MATERIALS RESEARCH SOCIETY
SYMPOSIUM PROCEEDINGS VOLUME 1160**

Materials and Physics for Nonvolatile Memories

Symposium held April 14–17, 2009, San Francisco, California, U.S.A.

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Cambridge, New York, Melbourne, Madrid, Cape Town,
Singapore, São Paulo, Delhi, Mexico City

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

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org

Information on this title: www.cambridge.org/9781107408296

Materials Research Society
506 Keystone Drive, Warrendale, PA 15086
<http://www.mrs.org>

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First published 2009
First paperback edition 2012

Single article reprints from this publication are available through
University Microfilms Inc., 300 North Zeeb Road, Ann Arbor, MI 48106

CODEN: MRSPDH

ISBN 978-1-107-40829-6 Paperback

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PREFACE

Symposium H, "Materials and Physics for Nonvolatile Memories," held April 14–17 at the 2009 MRS Spring Meeting in San Francisco, California, was the third in a series of MRS symposia on nonvolatile memories. Progress in the technical development of many kinds of nonvolatile memories since the previous symposium in 2007 was highlighted during this symposium.

Research results on Advanced Flash Memories including nano-particle floating gate FETs, MRAM, FeRAM, ReRAM and Phase Change RAMs as well as memories using polymer materials were presented. The papers in this volume are published in the order they were presented during the symposium. The advanced Flash memory and charge trap memory chapters include the state of the art in the post Flash memory technologies. The charge trap memory chapter shows the challenges to make a brake though the limitation of high density Flash memories. The field of resistance switching materials is maturing rapidly as demonstrated by the excellent overview and summary of ReRAM switching mechanisms in the Resistive Switching RAM chapter. The Ferroelectric Nonvolatile Memory Devices chapter focuses on the advances in materials and device demonstrations for both capacitor type and ferroelectric gate memory approaches to achieve high density ferroelectric memories. The Phase Change Nonvolatile Memory Devices chapter describes a wide variety of materials that continue to be considered for phase change and resistance switching memories, while the understanding of the most established materials are quickly maturing. The Magnetic Resistive RAM chapter includes papers from a joint session between this symposium and Symposium FF, "Novel Materials and Devices for Spintronics."

The strong and increasing interest in nonvolatile memories, both domestic and international, indicates the worldwide importance of these materials and memory devices. This symposium proceedings volume represents the latest technical advances and information on nonvolatile memory devices from universities, national laboratories and industry. It also provides insight into emerging trends in these exciting technologies.

We would like to thank all of the speakers and participants for their valuable contributions toward making the symposium successful. We gratefully acknowledge the financial support of ANEALYSYS, Ion Beam Services, Park Systems, SVT Associates, Inc. and Universal Systems.

Yoshihisa Fujisaki
Rainer Waser
Tingkai Li
Caroline Bonafos

August 2009

Cambridge University Press

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