

**MATERIALS RESEARCH SOCIETY
SYMPOSIUM PROCEEDINGS VOLUME 1251**

Phase-Change Materials for Memory and Reconfigurable Electronics Applications

April 5 – 9, 2010
San Francisco, California, USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-61782-218-6

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2010) by the Materials Research Society
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact the Materials Research Society
at the address below.

Materials Research Society
Proceedings
506 Keystone Dr.
Warrendale, PA 15086

Phone: 724-779-3004 x 531
Fax: 724-779-4396

eproceedings@mrs.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: currans@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Crystallization of Ion Amorphized Ge₂Sb₂Te₅ in Nano-structured Thin Films.....	1
<i>A. M. Mio, E. Carria, R. De Bastiani, M. Miritello, C. Bongiorno, G. D'Arrigo, C. Spinella, M. G. Grimaldi, E. Rimini</i>	
Crystallization Behavior of Ge₁Cu₂Te₃ Amorphous Film	7
<i>Y. Sutou, T. Kamada, Y. Saito, M. Sumiya, J. Koike</i>	
Stress Limited Scaling in Ge₂Sb₂Te₅	13
<i>Robert E. Simpson, Milos Krbal, Paul J. Fons, Alexander V. Kolobov, Tomoya Uruga, Hajime Tanida, Junji Tominaga</i>	
GeTe-filled Carbon Nanotubes for Data Storage Applications.....	19
<i>Cristina E. Giusca, Vlad Stolojan, Jeremy Sloan, Hidetsugu Shiozawa, S. Ravi P. Silva</i>	
Local Order and Crystallization of Laser Quenched and Ion Implanted Amorphous Ge_{1-x}Te_x Thin Films	25
<i>E. Carria, R. De Bastiani, S. Gibilisco, A. Mio, M. Miritello, A. R. Pennisi, C. Bongiorno, M. G. Grimaldi, E. Rimini</i>	
Studies of Ge-Sb-Te Phase Change Materials at and Above Melting Temperatures and Set to Reset Transition of Memory Devices.....	31
<i>Semyon D. Savransky, Guy Wicker</i>	
Study of Crystalline Structure N-doped GeSb Phase Change Material for PCRAM Applications.....	37
<i>A. Bastard, S. Lhostis, C. Bonafos, S. Schamm-Chardon, P. E. Coulon, F. Fillot, G. Ghezzi, A. Fantini, L. Perniola, S. Loubriat, A. Roule, E. Gourvest, E. Arbaout, A. Fargeix, M. Armand, B. Hyot, S. Maitrejean, V. Sousa</i>	
Ab Initio Calculations of Crystalline and Amorphous In₂Se₃ Compounds for Chalcogenide Phase Change Memory.....	43
<i>Renyu Chen, Scott T. Dunham</i>	
Influence of Bottom Contact Material on the Selective Chemical Vapor Deposition of Crystalline GeSbTe Alloys.....	49
<i>Alejandro G. Schrott, Chieh-Fang Chen, Matthew J. Breitwisch, Eric A. Joseph, Ravi K. Dasaka, Roger W. Cheek, Yu Zhu, Chung Lam</i>	
Phase Transition Behaviors of AgInSbTe-SiO₂ Nanocomposite Thin Films for Phasechange Memory Applications	55
<i>Yu-Jen Huang, Tzu-Chin Chung, Chiung-Hsin Wang, Tsung-Eong Hsieh</i>	
Ce Doped-GeSbTe Thin Films Applied to Phase-Change Random Access Memory Devices.....	61
<i>Yu-Jen Huang, Min-Chuan Tsai, Chiung-Hsin Wang, Tsung-Eong Hsieh</i>	
Crystalline Path Formation in Nanoglasses of PCM.....	67
<i>M. Nardone, M. Simon, I. V. Karpov, V. G. Karpov</i>	

Activated Pulsed Metalorganic Chemical Vapor Deposition of Ge₂Sb₂Te₅ Thin Films Using Alkyl Precursors.....	74
<i>Denis Reso, Mindaugas Silinskas, Bodo Kalkofen, Marco Lisker, Edmund P. Burte</i>	
The Role of Vacancies in the Pressure Amorphisation Phenomenon Observed in Ge-Sb-Te Phase Change Alloys	80
<i>M. Krbal, A. V. Kolobov, P. Fons, J. Tominaga, J. Haines, A. Pradel, M. Ribes, C. Levelut, R. Le Parc, M. Hanfland</i>	
Understanding Phase Change Memory Reliability and Scaling by Physical Models of the Amorphous Chalcogenide Phase	87
<i>Daniele Ielmini</i>	
Electrical Resistance Change with Crystallization in Si-Te Amorphous Thin Films.....	99
<i>Yuta Saito, Yuji Sutou, Junichi Koike</i>	
Amorphization of Crystalline Phase Change Material by Ion Implantation.....	105
<i>Simone Raoux, Guy M. Cohen, Robert M. Shelby, Huai-Yu Cheng, Jean L. Jordan Sweet</i>	
Charge Transport in Nanoglasses of Phase-Change Memory.....	111
<i>M. Simon, M. Nardone, S. A. Kostylev, I. V. Karpov, V. G. Karpov</i>	
Author Index	