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Editors: Vladimir Matias, Ruben Hühne, Seung-Hyun Moon and Robert Hammond  
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**MATERIALS RESEARCH SOCIETY  
SYMPOSIUM PROCEEDINGS VOLUME 1150**

# Artificially Induced Grain Alignment in Thin Films

Symposium held December 2–3, 2008, Boston, Massachusetts, U.S.A.

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Editors: Vladimir Matias, Ruben Hühne, Seung-Hyun Moon and Robert Hammond

Frontmatter

[More information](#)

Preface .....	ix
Acknowledgments .....	xi
Materials Research Society Symposium Proceedings.....	xii

### *MILESTONES IN IBAD TEXTURING*

* <b>Inducing Grain Alignment in Metals, Compounds and Multicomponent Thin Films</b> .....	3
James M.E. Harper	
* <b>Development of IBAD Process for Biaxial Texture Control of RE-123 Coated Conductors</b> .....	15
Yasuhiro Iijima	
<b>From IBM (Harper) to Stanford, From IBAD-YSZ to ITaN-MgO</b> .....	25
Robert H. Hammond	

### *IBAD TEXTURING*

* <b>Investigation of Early Nucleation Events in Magnesium Oxide During Ion Beam Assisted Deposition</b> .....	37
James R. Groves, Robert H. Hammond, Raymond F. DePaula, and Bruce M. Clemens	
* <b>Generating MgO Single- and Bi-Crystal Templates on Hard and Soft Substrates Using Ion Beam Assisted Texturing Process</b> .....	49
Judy Wu, Rongtao Lu, and Ronald Vallejo	
<b>Ion-Beam Assisted Pulsed Laser Deposition of Textured Transition-Metal Nitride Films</b> .....	59
Ruben Hühne, Martin Kidszun, Konrad Güth, Franziska Thoss, Bernd Rellinghaus, Ludwig Schultz, and Bernhard Holzapfel	

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Frontmatter

[More information](#)

<b>* Formation of Biaxial Crystalline Texture by Oblique Ion Bombardment.....</b>	<b>65</b>
Paul Berdahl, Ronald P. Reade, and Richard E. Russo	
<b>* Aligned-Crystalline Si Films on Non-Single-Crystalline Substrates .....</b>	<b>73</b>
Alp Findikoglu, Terry Holesinger, Alyson Niemeyer, Vladimir Matias, and Ozan Ugurlu	
<b>Development of Conducting Buffer Architectures Using Cube Textured IBAD-TiN Layers .....</b>	<b>85</b>
Ruben Hühne, Konrad Güth, Martin Kidszun, Rainer Kaltofen, Vladimir Matias, John Rowley, Ludwig Schultz, and Bernhard Holzapfel	
<b>Texture Evolution in Ion-Beam-Assist Deposited MgO .....</b>	<b>91</b>
Vladimir Matias, Marcel Hoek, Jens Hänisch, and Alp Findikoglu	
<b>ROUND TABLE DISCUSSION: Texturing Mechanisms in Thin Films .....</b>	<b>99</b>

### *IBAD LONG LENGTH APPLICATION*

<b>* IBAD-MgO Architecture at SRL for Long Length IBAD/PLD Coated Conductors .....</b>	<b>111</b>
Yutaka Yamada, Seiki Miyata, Masateru Yoshizumi, Hiroyuki Fukushima, Akira Ibi, Teruo Izumi, Yuh Shiohara, Takeharu Kato, and Tsukasa Hirayama	
<b>* In-Plane Texturing of Buffer Layers by Alternating Beam Assisted Deposition: Large Area and Small Area Applications .....</b>	<b>117</b>
Alexander Usoskin and Lutz Kirchhoff	
<b>High Yield and High Throughput Reactive IBAD MgO Process for Long-length, HTS Wire Production at SuperPower .....</b>	<b>123</b>
Xuming Xiong, Karol Zdun, Sunjing Kim, Andrei Rar, Senthil Sambandam, Robert Schmidt, Yimin Chen, Kenneth Lenseth, and Venkat Selvamanickam	

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Editors: Vladimir Matias, Ruben Hühne, Seung-Hyun Moon and Robert Hammond  
Frontmatter[More information](#)**TEXTURING BY OTHER TECHNIQUES**

- Abnormal Grain Growth Behavior in Nanostructured Al Thin Films on SiO<sub>2</sub>/Si Substrates** .....133  
Flavia P. Luce, Paulo Fichtner, Luiz F. Schelp,  
and Fernando Zawislak
- \* **Artificial Grain Alignment of Organic Crystalline Thin Films** .....139  
Toshihiro Shimada
- \* **Inclined Substrate Deposition of Biaxially Textured Magnesium Oxide Films** .....151  
Beihai Ma, U. (Balu) Balachandran,  
Rachel E. Koritala, and Dean J. Miller
- Low-Temperature Selective Growth of Heteroepitaxial  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> Thin Films on a NiO Layer by the Electron-Beam Assisted PLD Process** .....167  
Makoto Hosaka, Yasuyuki Akita,  
Yuki Sugimoto, Yushi Kato, Yusaburo Ono,  
Akifumi Matsuda, Koji Koyama, and  
Mamoru Yoshimoto
- Intensity-Modulated Excimer Laser Annealing to Obtain (001) Surface-Oriented Poly-Si Films on Glass: Molecular Dynamics Study** .....173  
Norie Matsubara, Tomohiko Ogata,  
Takanori Mitani, Shinji Munetoh, and  
Teruaki Motooka
- Crystallization Processes of Amorphous Si During Excimer Laser Annealing in Complete-Melting and Near-Complete-Melting Conditions: A Molecular Dynamics Study** .....179  
Tomohiko Ogata, Takanori Mitani,  
Shinji Munetoh, and Teruaki Motooka

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Editors: Vladimir Matias, Ruben Hühne, Seung-Hyun Moon and Robert Hammond

Frontmatter

[More information](#)

<b>Carbon Nanotube-Induced Changes of Crystal Growth in Polymer Films.....</b>	<b>185</b>
Georgi Y. Georgiev, Yaniel Cabrera, Lauren Wielgus, Zarnab Iftikhar, Michael Mattera, Peter Gati, Austin Potter, and Peggy Cebe	
<b>Author Index .....</b>	<b>191</b>
<b>Subject Index.....</b>	<b>193</b>



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Frontmatter

[More information](#)

## PREFACE

Thin film growth is a very old art and an established scientific field in materials science. Within this field, growth of monocrystal-like films has been practiced for many decades by making use of epitaxy on monocrystalline substrates. In the quest for greater control of materials, the next level of achievement would be to grow well-oriented thin films on arbitrary substrates, i.e., without the need of monocrystalline substrates. This is what is attempted by artificially inducing grain alignment in thin films. We use the term “artificially” to refer to film growth methods that do not utilize a monocrystalline substrate to obtain in-plane alignment. Uniaxial, out-of-plane film texture can be obtained for many materials by surface energy minimization. The absence of a template for epitaxy usually means that something else needs to determine the crystalline orientation in the plane of the film and break rotational symmetry. The source of this biaxial alignment can be an off-axis energetic beam impinging during deposition or the deposition flux itself. Over the last three decades a variety of methods for grain alignment have been demonstrated with varying degrees of success.

Symposium RR, “Artificially Induced Grain Alignment in Thin Films,” held December 2–3 at the 2008 MRS Fall Meeting in Boston, Massachusetts, represents a first attempt to bring together researchers from around the world working on artificial grain alignment in films. Our particular emphasis for the symposium, based on our own experiences, was in physical vapor deposition methods for growth of inorganic thin films, with special attention paid to ion beam assisted deposition (IBAD) texturing. The symposium speakers and attendees represented a range of organizations from academia, national laboratories and industry. These proceedings capture some of about 40 presentations made at the symposium and some of the lively discussion. The symposium Round Table discussion session is transcribed starting on page 99.

We look forward to many exciting future developments in the field, and we feel confident that this field will radically change thin film growth and its applications. Grain alignment in films promises to be an enabler for a number of new technologies. We expect that a new generation of advanced film-based devices will result from the critical advancements in this field.

Vladimir Matias  
Ruben Hühne  
Seung-Hyun Moon  
Robert Hammond

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