

ICHIRO TAKEUCHI

Professor

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EDUCATION

Ph.D. Physics	University of Maryland, College Park, MD Advisors: T. Venkatesan and Chris Lobb	August, 1996
B.S. Physics	California Institute of Technology, Pasadena, CA	June, 1987

EMPLOYMENT EXPERIENCE

2010 to present

Chief Technology Officer

Maryland Energy and Sensor Technologies, LLC
College Park, MD

7/2009-7/2013, 2014-present

Visiting Professor

Department of Applied and Industrial Chemistry
Tokyo University of Science, Chiba, Japan

7/2009 to present

Professor

Department of Materials Science and Engineering
University of Maryland, College Park, MD

2004 to present

Affiliate Professor

Department of Physics
University of Maryland, College Park, MD

10-11/2009

Visiting Professor

Research Department on Integrity of Microsystems and High Temperature Materials
Ruhr University Bochum, Germany

8/2004 to 7/2009

Associate Professor

Department of Materials Science and Engineering, and Center for Superconductivity Research
University of Maryland, College Park, MD

4/2007 to 8/2007

Visiting Associate Professor

Institute for Solid State Physics
University of Tokyo, Kashiwa, Japan

6/2004 to 3/2005

Visiting Associate Professor

Applied Ceramics Laboratory
Tokyo Institute of Technology, Yokohama, Japan

7/1999 to 7/2004

Assistant Professor

Department of Materials Science and Engineering, Small Smart Systems Center, and Center for Superconductivity Research
University of Maryland, College Park, MD

9/1996-7/1999

Postdoctoral Research Fellow

Materials Sciences Division, Lawrence Berkeley National Laboratory, University of California, Berkeley, CA; Advisors: P. G. Schultz and X.-D. Xiang

5/1999-7/1999, 11/1999

Visiting Scientist

National Center for Electron Microscopy
Lawrence Berkeley National Laboratory, Berkeley, CA

8/1991-9/1996

Graduate Research Associate

Center for Superconductivity Research, Department of Physics
University of Maryland, College Park, MD

5/1996

Visiting Scientist

Device Materials Group, Department of Materials Science
University of Cambridge, England

9/1987-8/1991

Member of the Technical Research Staff

Microelectronics Research Laboratories and Fundamental Research Laboratories
NEC Corporation, Kawasaki and Tsukuba, Japan

RESEARCH INTERESTS

Applications of combinatorial synthesis and characterization methodology to electronic, sensor/actuator, and energy materials. Fabrication and characterization of novel multilayer thin-

film devices. Variable temperature scanning probe microscopes. Thirty years of experience in various aspects of thin-film deposition and characterization, MEMS device fabrication, and low temperature measurements.

PUBLICATIONS

Total number of citations as of May 2017 (Google scholar): 8152; h-factor: 48.

Books Edited

1. "Materials and Devices for Smart Systems," edited by Y. Furuya, I. Takeuchi, J. Su, MRS Symposium Proceedings Series, volume 888, Fall 2005 meeting, Boston, MA (ISBN: 1-55899-842-X)
2. "Combinatorial and Artificial Intelligence Methods in Materials Science," edited by Ichiro Takeuchi, John M. Newsam, Luc T. Wille, Hideomi Koinuma, Eric J. Amis, MRS Symposium Proceedings Series, volume 700, Fall 2001 meeting, Boston, MA (ISBN: 1-55899-636-2)
3. Combinatorial Materials Synthesis, edited by Ichiro Takeuchi and Xiao-Dong Xiang, publisher: Marcel Dekker, 2003 (ISBN: 0-8247-4119-6)

Book Chapters

12. Daisuke Kan, Ching-Jung Cheng, Valanoor Nagarajan, and Ichiro Takeuchi, "Structure-property correlations in rare-earth substituted BiFeO₃ epitaxial thin films at morphotropic phase boundary," in Functional Metal Oxides: New Science and Novel Applications, edited by S. B. Ogale, T. Venkatesan, and M. Blamire, publisher Wiley, 2013 (ISBN-10: 3527331794)
11. J. C. Booth, J. Mateu, N. Orloff, I. Takeuchi, "Methods of characterization of broadband dielectric properties challenges in device fabrication and measurements," in Ferroelectric thin films at microwave frequencies, research signposts, T.C. 37/661(2) Fort Post Office, Trivandrum 695023, Kerala, 695023, India.
10. Ichiro Takeuchi and Samuel E. Lofland, "Determination of Phase Diagrams involving Magnetic Phase Diagrams," in Methods for Phase Diagram Determination, edited by J.-C. Zhao, publisher Elsevier, 2007 (ISBN: 978-0-08-044629-5)
9. Ichiro Takeuchi, "Combinatorial Synthesis of Functional Metal Oxide Thin Films," in Thin Film and Heterostructures for Oxide Electronics, edited by Satishchandra B. Ogale, publisher Springer, 2005 (ISBN: 0-387-25802-7)
8. R. D. Vispute, S. S. Hullavarad, D. E. Pugel, V. N. Kulkarni, S. Dhar, I. Takeuchi and T. Venkatesan, "Wide Band Gap ZnO and ZnMgO Heterostructures for Future Optoelectronic Devices," in Thin Film and Heterostructures for Oxide Electronics, edited by Satishchandra B. Ogale, publisher Springer, 2005 (ISBN: 0-387-25802-7)
7. Ichiro Takeuchi, Lee Knauss, and Frederick C. Wellstood, "Scanning SQUID Microscope," in Encyclopedia of Materials: Science and Technology – Updates, publisher Pergamon, ISBN:0-08-043152-6, pp. 1-4, 2003.
6. Ichiro Takeuchi, "Combinatorial Pulsed Laser Deposition," in Pulsed Laser Deposition of Thin Films: Applications in Electronics, Sensors and Biomaterials, edited by Robert W. Eason, publisher: Wiley, 2006 (ISBN: 0-471-44709-9).
5. Hauyee Chang and Ichiro Takeuchi, "Combinatorial Approach to Ferroelectric/Dielectric Materials," Combinatorial Materials Syntheses, edited by Ichiro Takeuchi and Xiao-Dong Xiang, August 2003, publisher: Marcel Dekker, 2003 (ISBN:0-8247-4119-6).
4. Xiao-Dong Xiang and Ichiro Takeuchi, "Introduction," Combinatorial Materials Syntheses, edited by Ichiro Takeuchi and Xiao-Dong Xiang, August 2003, publisher: Marcel Dekker, 2003 (ISBN:0-8247-4119-6).

3. I. Takeuchi, J. S. Tsai, S. Ishizaka, T. Yoshitake, S. Satoh and J. Fujita, "Single-Electron Tunneling Effects at the Surfaces of Oxide Superconductor Films," in Single-Electron Tunneling and Mesoscopic Devices edited by H. Koch and H. Lubbig, Springer Series in Electronics and Photonics 31 (ISBN 3-540-55132-8), p. 75-81.

2. J. S. Tsai and I. Takeuchi, "Tunneling Spectroscopy and Energy Gap of High T_c Oxide Superconductors," in Strong Correlation and Superconductivity edited by H. Fukuyama, S. Maekawa and A. P. Malozemoff, Springer Series in Solid-State Sciences, Vol. 89 (ISBN 3-540-51320-5), 274-279 (1990).

1. J. S. Tsai, I. Takeuchi, J. Fujita, T. Yoshitake, S. Miura, S. Tanaka, T. Terashima, Y. Bando, K. Iijima, and K. Yamamoto, "Energy Gap Measurement Made on Cryogenically Cleaved Y-Ba-Cu-O and Bi-Sr-Ca-Cu-O Surfaces," in Mechanisms of High Temperature Superconductivity edited by H. Kamimura and A. Oshiyama, Springer Series in Materials Science, Vol. 11 (ISBN 3-540-50726-4), 229-237 (1989).

Articles in Refereed Journals

superscript key: 1: students under my direction; 2: students not under my direction but with whom I worked closely; 3: post-docs under my direction or with whom I worked closely; all other authors: collaborators.

214. Tieren Gao³, Xiaohang Zhang³, William Ratcliff, Shingo Maruyama³, Makoto Murakami³, Anbusathaiah Varatharajan³, Zahra Yamani, Peijie Chen, Ke Wang, Huairuo Zhang, Robert D Shull, Leonid A Bendersky, John Unguris, 214 Ramamoorthy Ramesh, Ichiro Takeuchi, "Electric-field Induced Reversible Switching of the Magnetic Easy-axis in Co/BiFeO₃ on SrTiO₃," Nano Letters 2017 DOI: 10.1021/acs.nanolett.6b05152

213. F Burkert, M Janowski, X Zhang³, I Takeuchi, CA Kuntscher, "Chemical pressure effect in Sm and La substituted ferroelectric BiFeO₃ thin films: Insights from infrared spectroscopy," Journal of Applied Physics **121**, 144103 (2017)

212. Kenjiro Fujimoto, Minoru Gibu, Yuki Yamaguchi, Akihisa Aimi, Keishi Nishio, Oded Rabin, Ichiro Takeuchi, "Thermoelectric properties of bismuth-substituted calcium manganite Ca_{1-x}Bi_xMnO_{3-δ} prepared via the electrostatic spray deposition method," Journal of the Ceramic Society of Japan **125**, 318 (2017).

211. ML Green, CL Choi, JR Hattrick-Simpers, AM Joshi, I Takeuchi, SC Barron, E Campo, T Chiang, S Empedocles, JM Gregoire, AG Kusne, J Martin, A Mehta, K Persson, Z Trautt, J Van Duren, Andriy Zakutayev, "Fulfilling the promise of the materials genome initiative with high-throughput experimental methodologies," Applied Physics Reviews **4**, 011105 (2017).

210. Y. Iwasaki, AG. Kusne, I. Takeuchi, "Comparison of dissimilarity measures for cluster analysis of X-ray diffraction data from combinatorial libraries," npj Computational Materials **3**, 4 (2017).

209. Sean W Fackler¹, Vasileios Alexandrakis, Dennis König, A Gilad Kusne, Tieren Gao³, Matthew J Kramer, Drew Stasak, Kenny Lopez, Brad Zayac, Apurva Mehta, Alfred Ludwig, Ichiro Takeuchi, "Combinatorial study of Fe-Co-V hard magnetic thin films," Science and Technology of advanced MaTerialS **18**, 231 (2017).

208. K Terakura, I Takeuchi, "Focus on materials genome and informatics," Science and Technology of advanced MaTerialS **18**, 1 (2017).

207. C Nyshadham, C Oses, JE Hansen, I Takeuchi, S Curtarolo, GLW Hart, "A computational high-throughput search for new ternary superalloys," Acta Materialia **122**, 438 (2017).

206. Seunghun Lee³, Xiaohang Zhang, Yangang Liang¹, SeanW. Fackler¹, Jie Yong, Xiangfeng Wang, Johnpierre Paglione, Richard L. Greene, and Ichiro Takeuchi, "Observation of the Superconducting Proximity Effect in the Surface State of SmB₆ Thin Films," Physical Review X **6**, 031031 (2016).

205. TR Gao³, L Fang³, S Fackler¹, S Maruyama³, XH Zhang³, LL Wang, T Rana, P Manchanda, A Kashyap, K Janicka, AL Wysocki, AT N'Diaye, E Arenholz, JA Borchers, BJ Kirby, BB Maranville, KW Sun, MJ Kramer, VP Antropov, DD Johnson, R Skomski, J Cui, I Takeuchi, "Large energy product enhancement in perpendicularly coupled MnBi/CoFe magnetic bilayers," Physical Review B **94**, 060411(R) (2016).

204. Benjamin Ruiz-Yi, Jonathan Kenneth Bunn, Drew Stasak¹, Apurva Mehta, Matthew Besser, Matthew J Kramer, Ichiro Takeuchi, Jason Hatrick-Simpers, “The Different Roles of Entropy and Solubility in High Entropy Alloy Stability,” *ACS Combinatorial Science* **18**, 596-603 (2016).
203. Suxin Qian², Yunlong Geng³, Yi Wang³, Thomas E. Pillsbury, Yoshiharu Hada, Yuki Yamaguchi, Kenjiro Fujimoto, Yunho Hwang, Reinhard Radermacher, Jun Cui, Yoji Yuki, Koutaro Toyotake, Ichiro Takeuchi, “Elastocaloric effect in CuAlZn and CuAlMn shape memory alloys under compression,” *Philosophical Transactions A* **374**: 20150309. <http://dx.doi.org/10.1098/rsta.2015.0309>
202. Ronald Maran³, Shintaro Yasui, Eugene Eliseev, Anna Morozovska, Hiroshi Funakubo, Ichiro Takeuchi, Nagarajan Valanoor, “Enhancement of Dielectric Properties in Epitaxial Bismuth Ferrite–Bismuth Samarium Ferrite Superlattices,” *Advanced Electronic Materials* **2**, 1600170 (2016). doi:10.1002/aelm.201600170 (cover article)
201. Kui Jin, Wei Hu, Beiyi Zhu, Dohun Kim, Jie Yuan, Yujie Sun, Tao Xiang, Michael S. Fuhrer, Ichiro Takeuchi, Richard L. Greene, “Evolution of electronic states in n-type copper oxide superconductor via electric double layer gating,” *Scientific Reports* **6**, 26642 (2016).
200. Z. Li, S. Yasui, S. Takeuchi, A. Creuziger, S. Maruyama, A. Herzing, I. Takeuchi, L. A. Bendersky, “Structural study of epitaxial LiCoO₂ films grown by PLD on single crystal SrTiO₃ substrates,” *Thin Solid Films* **612**, 472-482 (2016).
199. Suxin Qian², Yunlong Geng³, Yi Wang³, Jan Muehlbauer, Jiazhen Ling, Yunho Hwang, Reinhard Radermacher, Ichiro Takeuchi, “Design of a hydraulically driven compressive elastocaloric cooling system,” *Science and Technology for the Built Environment* DOI: 10.1080/23744731.2016.1171630.
198. Y. Jiang, X. Zhang³, S. Khim, D. Bhoi, K.-H. Kim, R. L. Greene, I. Takeuchi, “Unconventional Andreev reflection on the quasi-one-dimensional superconductor Nb₂Pd_xSe₅,” *AIP Advances* **6**, 045210 (2016).
197. K. K. Bharathi³, H Tan, S. Takeuchi, L. Meshi, H. Shen, J. Shin³, I. Takeuchi, L. Bendersky, “Effect of oxygen pressure on structure and ionic conductivity of epitaxial Li_{0.33}La_{0.55}TiO₃ solid electrolyte thin films produced by pulsed laser deposition,” *RSC Advances* **6**, 61974-61983 (2016).
196. Wonkyung Kim, Miyeon Cheon, Seunghun Lee, Tae-Woo Lee, Jung Jin Park, Chae Ryong Cho, Chul Hong Park, Ichiro Takeuchi, Se-young Jeong, “Magnetic domains in H-mediated Zn_{0.9}Co_{0.1} O microdisk arrays,” *RSC Advances* **6**, 57375-57379 (2016).
195. Robert E Usiskin, Shingo Maruyama³, Chris J Kucharczyk, Ichiro Takeuchi, Sossina M Haile, “Probing the reaction pathway in (La_{0.8}Sr_{0.2})_{0.95}MnO_{3+δ} using libraries of thin film microelectrodes,” *Journal of Materials Chemistry A* **3**, 19330 (2015).
194. Haiyan Tan, Saya Takeuchi, K. Kamala Bharathi³, Ichiro Takeuchi, and Leonid A. Bendersky, “Microscopy Study of Structural Evolution in Epitaxial LiCoO₂ Positive Electrode Films during Electrochemical Cycling,” *ACS Applied Materials & Interfaces* **8**, 6727-6735 (2016).
193. T.H. Rana, P. Manchanda, B. Balamurugan, A. Kashyap, T.R. Gao³, I. Takeuchi, J. Cun, S. Biswas, R.F. Sabirianov, D.J. Sellmyer, R. Skomski, “Micromagnetism of MnBi: FeCo thin films,” *Journal of Physics D: Applied Physics* **49**, 075003 (2016).
192. Yangang Liang¹, Yangyi Yao, Xiaohang Zhang³, Wei-Lun Hsu, Yunhui Gong, Jongmoon Shin³, Eric D Wachsman, Mario Dagenais, Ichiro Takeuchi, “Fabrication of organic-inorganic perovskite thin films for planar solar cells via pulsed laser deposition,” *AIP Advances* **6**, 015001 (2016).
191. Demet Usanmaz, Pinku Nath, Jose Plata, Gus L. W. Hart, Ichiro Takeuchi, Marco Buongiorno Nardelli, Marco Fornari, Stefano Curtarolo, “First principles thermodynamical modeling of the binodal and spinodal curves in lead chalcogenides,” *Physical Chemistry Chemical Physics* **18**, 5005 (2016).

190. Suxin Qian², Yunlong Geng³, Yi Wang³, Jiazhen Ling, Yunho Hwang, Reinhard Radermacher, Ichiro Takeuchi, Jun Cui, "A review of elastocaloric cooling: materials, cycles and system integrations," *International Journal of Refrigeration* **64**, 1-19 (2016).
189. Ichiro Takeuchi and Karl Sandeman, "Solid-state cooling with caloric materials," *Physics Today* **68**, 48 (2015). (cover article)
188. Yi Wang¹, Tiberiu-Dan Onuta³, Christian J Long¹, Yunlong Geng³, Ichiro Takeuchi, "Colossal magnetoelectric effect induced by parametric amplification," *Applied Physics Letters* **107**, 192902 (2015).
187. Frank Chen, John Goodfellow, Shi Liu, Ilya Grinberg, Matthias C Hoffmann, Anoop R Damodaran, Yi Zhu, Peter Zalden, Xiaohang Zhang³, Ichiro Takeuchi, Andrew M Rappe, Lane W Martin, Haidan Wen, Aaron M Lindenberg, "Ultrafast Terahertz Gating of the Polarization and Giant Nonlinear Optical Response in BiFeO₃ Thin Films," *Advanced Materials* **27**, 192902 (2015).
186. Suxin Qian², Dennis Nasuta, Adam Rhoads, Yi Wang³, Yunlong Geng³, Yunho Hwang, Reinhard Radermacher, Ichiro Takeuchi, "Not-in-kind cooling technologies: A quantitative comparison of refrigerants and system performance," *International Journal of Refrigeration* **62**, 177-192 (2016).
185. A. G. Kusne, D. Keller, A. Anderson, A. Zaban, I Takeuchi, "High-throughput determination of structural phase diagram and constituent phases using GRENDDEL," *Nanotechnology* **26**, 444002 (2015). (cover article)
184. S. Maruyama³, J. Shin³, X. Zhang³, R. Suchoski¹, S. Yasui³, K. Jin³, R. L. Greene, and I. Takeuchi, "Reversible electrochemical modulation of the superconducting transition temperature of LiTi₂O₄ ultrathin films by ionic liquid gating," *Applied Physics Letters* **107**, 142602 (2015).
183. M. Staruch, C. Kassner, S. Fackler¹, I. Takeuchi, K. Bussmann, S. E. Lofland Jr., C. Dolabdjian, R. Lacombe, and P. Finkel, "Effects of magnetic field and pressure in magnetoelastic stress reconfigurable thin film resonators," *Applied Physics Letters* **107**, 032909 (2015).
182. K. Jin³, G. He, X. Zhang³, S. Maruyama³, S. Yasui³, R. Suchoski¹, J. Shin³, Y. Jiang, H.S. Yu, J. Yuan, L. Shan, F.V. Kusmartsev, R.L. Greene & I. Takeuchi, "Anomalous magnetoresistance in the spinel superconductor LiTi₂O₄," *Nature Communications* **6**, 7183 (2015).
181. Jie Yong³, Yeping Jiang³, Xiaohang Zhang³, Jongmoon Shin³, Ichiro Takeuchi, and Richard L. Greene, "Magnetotransport in nanocrystalline SmB₆ thin films," *AIP Advances* **5**, 077144 (2015).
180. Ying Li, Yi Liu, Tieren Gao³, Boce Zhang, Yingying Song, Jessica L. Terrell, Nathan Barber, William E. Bentley, Ichiro Takeuchi, Gregory F. Payne, and Qin Wang, "Self-Assembly with Orthogonal-Imposed Stimuli To Impart Structure and Confer Magnetic Function To Electrodeposited Hydrogels," *ACS Appl. Mater. Interfaces* **7**, 10587-10598 (2015).
179. David A. Keller, Adam Ginsburg, Hannah-Noa Barad, Klimentiy Shimanovich, Yaniv Bouhadana, Eli Rosh-Hodesh, Ichiro Takeuchi, Hagit Aviv, Yaakov R. Tischler, Assaf Y. Anderson, and Arie Zaban, "Utilizing Pulsed Laser Deposition Lateral Inhomogeneity as a Tool in Combinatorial Material Science," *ACS Combinatorial Science* **17**, 209-216 (2015).
178. Saya Takeuchi, Haiyan Tan, K. Kamala Bharathi, Gery R. Stafford, Jongmoon Shin, Shintaro Yasui³, Ichiro Takeuchi, and Leonid A. Bendersky, "Epitaxial LiCoO₂ Films as a Model System for Fundamental Electrochemical Studies of Positive Electrodesm" *ACS Appl. Mater. Interfaces* **7**, 7901-7911 (2015).
177. Suxin Qian², Abdullah Alabdulkarem, Jiazhen Ling, Jan Muehlbauer, Yunho Hwang, Reinhard Radermacher, Ichiro Takeuchi, "Performance enhancement of a compressive thermoelastic cooling system using multi-objective optimization and novel designs," *International Journal of Refrigeration* **57**, 62-76 (2015).

176. Suxin Qian², Jiazhen Ling, Yunho Hwang, Reinhard Radermacher, Ichiro Takeuchi, “Thermodynamics cycle analysis and numerical modeling of thermoelastic cooling systems,” *International Journal of Refrigeration* **56**, 65-80 (2015).

175. Tiberiu Onuta³, Yi Wang¹, Samuel E. Lofland, and Ichiro Takeuchi, “Multiferroic operation of dynamic memory based on heterostructured cantilevers,” *Advanced Materials* **27**, 202-206 (2015).

174. Fei Xue, Linyun Liang, Yijia Gu, Ichiro Takeuchi, Sergei V. Kalinin, and Long-Qing Chen, “Composition- and pressure-induced ferroelectric to antiferroelectric transition phase transitions in Sm-doped BiFeO₃ system,” *Applied Physics Letters* **106**, 012903 (2015).

173. Shingo Maruyama³, V Anbusathaiah³, Amy Poole, Enderle Mechthild, Ichiro Takeuchi, William D. Ratcliff “Change in the magnetic structure of (Bi,Sm)FeO₃ thin films at the morphotropic phase boundary probed by neutron diffraction,” *APL Materials* **2**, 116106 (2014).

172. Ralph Skomski, Priyanka Manchanda, Ichiro Takeuchi, Jun Cui, “Geometry Dependence of Magnetization Reversal in Nanocomposite Alloys,” *Journal of the Minerals, Metals, & Materials Society* **66**, 1144 (2014).

171. Jie Yong³, Yeping Jiang³, Demet Usanmaz, Stefano Curtarolo, Xiaohang Zhang³, Linze Li, Xiaoqing Pan, Jongmoon Shin³, Ichiro Takeuchi, and Richard L. Greene, “Robust Surface States indicated by Magnetotransport in SmB₆ Thin Films,” *Applied Physics Letters* **105**, 222403 (2014)

170. Ronald Maran², Shintaro Yasui³, Eugene A. Eliseev, Maya D. Glinchuk, Anna N. Morozovska, Hiroshi Funakubo, Ichiro Takeuchi, and Valanoor Nagarajan, “Interface control of a morphotropic phase boundary in epitaxial samarium modified bismuth ferrite superlattices,” *Physical Review B* **90**, 245131 (2014).

169. Sean W. Fackler¹, Michael J. Donahue, Tieren Gao³, Paris N. A. Nero², Sang-Wook Cheong, John Cumings, and Ichiro Takeuchi, “Locally controlled magnetic anisotropy in transcritical permalloy thin films using ferroelectric BaTiO₃ domains,” *Applied Physics Letters* **105**, 212905 (2014).

168. Aaron Gilad Kusne³, Tieren Gao³, Apurva Mehta, Liqin Ke, Manh Cuong Nguyen, Kai-Ming Ho, Vladimir Antropov, Cai-Zhuang Wang, Matthew J Kramer, Christian Long¹, and Ichiro Takeuchi, “On-the-fly machine-learning for high-throughput experiments: search for rare-earth-free permanent magnets,” *Scientific Reports* **4**, 6367 (2014).

167. J Unguris, SR Bowden, DT Pierce, M Trassin, R Ramesh, S-W Cheong, S Fackler¹, I Takeuchi, “Simultaneous imaging of the ferromagnetic and ferroelectric structure in multiferroic heterostructures,” *APL Materials* **2**, 076109 (2014).

166. Marcel Risch, Kelsey A. Stoerzinger, Shingo Maruyama³, T. Hong, Ichiro Takeuchi, and Yang Shao-Horn, “La_{0.8}Sr_{0.2}MnO_{3-δ} decorated with Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-δ}: a bifunctional surface for oxygen electrocatalysis with enhanced stability and activity,” *Journal of American Chemical Society* **136**, 5229–5232 (2014).

165. Luz M. Sanchez, Alden D. Grobicki, Gabriel L. Smith, Jeffrey S. Pulskamp, Ichiro Takeuchi, and Ronald G. Polcawich, “Texture control in Lead Zirconate Titanate Multilayer Thin Films,” *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control* **61**, 654-661 (2014).

164. J. Cui, J. P. Choi, G. Li, E. Polikarpov, J. Darsell, N. Overman, M. Olszta, D. Schreiber, M. Bowden, T. Droubay, M. J. Kramer, N. A. Zarkevich, L. L. Wang, D. D. Johnson, M. Marinescu, I. Takeuchi, Q. Z. Huang, H. Wu, H. Reeve, N. V. Vuong, and J. P. Liu, “Thermal stability of MnBi magnetic materials,” *Journal of Physics: Condensed Matter* **26**, 064212 (2014).

163. Seunghun Lee, Won-Kyung Kim, Yong Chan Cho, Bum-Su Kim, Ji Hun Park, Chang-Won Lee, YoungPak Lee, Sangbok Lee, Sean Fackler¹, Ichiro Takeuchi, Chae Ryong Cho, and Se-Young Jeong, “Hydrogen lithography for nanomagnetic domain on Co-doped ZnO using an anodic aluminum oxide template,” *Applied Physics Letters* **104**, 052405 (2014). (cover article)

162. Chuan-Sheng Hu, Zhen-Lin Luo, Xia Sun, Guo-Qiang Pan, Qing He, Wen Wen, Xing-Tai Zhou, Ichiro Takeuchi, Chen Gao, "Strain induced metastable phase and phase evolution in $\text{PbTiO}_3\text{-CoFe}_2\text{O}_4$ nanocomposite film," *Chinese Physics Letters* **31**, 017701 (2014).
161. Kui Jin³, Richard Suchoski¹, Sean Fackler¹, Yi Zhang, Xiaoqing Pan, Richard L. Greene, and Ichiro Takeuchi, "Combinatorial search of superconductivity in Fe-B composition spreads," *APL Materials* **1**, 042101 (2013).
160. Che-Hui Lee, Nathan D. Orloff¹, Turan Birol, Ye Zhu, Veronica Goian, Ryan Haislmaier, Eftihia Vlahos, Julia A. Mundy, Yuefeng Nie, Michael D. Biegalski, Jingshu Zhang, Margitta Bernhagen, Nicole A. Benedek, Yongsam Kim, Joel D. Brock, Reinhard Uecker, Xiaoxing Xi, Venkatraman Gopalan, Dmitry Nuzhnyy, Stanislav Kamba, David A. Muller, Ichiro Takeuchi, James C. Booth, Craig J. Fennie, & Darrell G. Schlom, "Exploiting dimensionality and defect mitigation to create tunable microwave dielectrics," *Nature* **502**, 532 (2013).
159. Seunghun Lee, Bum-Su Kim, Yong Chan Cho, Jong-Moon Shin, Seung-Wan Seo, Chae Ryong Cho, Ichiro Takeuchi, Se-Young Jeong, "Origin of the ferromagnetism in ZnCoO from chemical reaction of Co_3O_4 ," *Current Applied Physics* **13**, 2005 (2013).
158. L. M. Sanchez¹, D. M. Potrepka, G. R. Fox, I. Takeuchi, K.. Wang, L. Bendersky, R. G. Polcawich, "Optimization of PbTiO_3 seed layers and Pt metallization for PZT based piezoMEMS actuators," *Journal of Materials Research* **28**, 1920 (2013).
157. W. Ratcliff, II, Zahra Yamani, V. Anbusathaiah³, T. R. Gao³, P. A. Kienzle, H. Cao, and I. Takeuchi, "Electric-field-controlled antiferromagnetic domains in epitaxial BiFeO_3 thin films probed by neutron diffraction," *Physical Review B* **87**, 140405(R) (2013).
156. (Invited review, cover article) Martin L. Green, Ichiro Takeuchi, and Jason R. Hattrick-Simpers, "Applications of high throughput (combinatorial) methodologies to electronic, magnetic, optical, and energy-related materials," *J. Appl. Phys.* **113**, 231101 (2013).
155. L.A. Bendersky, N.V. Kazantseva, U.R. Kattner, K. Wang, V.P. Oleshko, D. Hunter¹, I. Takeuchi, "Interfacial reaction of Co-Fe films with SiO_2 substrates," *Acta Materialia* **61**, 4180 (2013).
154. T. R. Gao³, Y. Q. Wu, S. Fackler¹, I. Kierzewski¹, Y. Zhang, A. Mehta, M. J. Kramer, and I. Takeuchi, "Combinatorial exploration of rare-earth-free permanent magnets: magnetic and microstructural properties of Fe-Co-W thin films," *Applied Physics Letters* **102**, 022419 (2013).
153. Daisuke Kan, Christian J. Long, Christian Steinmetz, Samuel E. Lofland, Ichiro Takeuchi, "Combinatorial search of structural transitions: systematic investigation of morphotropic phase boundaries in chemically substituted BiFeO_3 ," *Journal of Materials Research* **27**, 2691 (2012). (Invited feature article)
152. Chan-Ho Yang, Daisuke Kan, Ichiro Takeuchi, Valanoor Nagarajan, and Jan Seidel, "Doping BiFeO_3 : approaches and enhanced functionality," *Physical Chemistry Chemical Physics* **14**, 15953-15962 (2012).
151. Jun Cui, Yiming Wu³, Jan Muehlbauer, Yunho Hwang, Reinhard Radermacher, Sean Fackler¹, Manfred Wuttig, and Ichiro Takeuchi, "Demonstration of high efficiency elastocaloric cooling with large ΔT using NiTi wires," *Applied Physics Letters* **101**, 073904 (2012).
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1. J. S. Tsai, I. Takeuchi, J. Fujita, T. Yoshitake, S. Miura, S. Tanaka, T. Terashima, Y. Bando, K. Iijima, and K. Yamamoto, "Observation of Gap Anisotropy in $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ by Tunneling," *Physica C* **153-155**, 1385 (1988).

INVITED TALKS

Takeuchi delivers about 15-20 invited talks and seminars every year at various conferences, international symposia, and universities.

FELLOWSHIPS, AWARDS, HONORS, AND OTHERS

Elected Fellow of American Physical Society (2010)
 Invention of the Year Award, Physical Sciences Category. Office of Technology Commercialization, University of Maryland (2010)
 Fellow by Special Appointment, Japan Science and Technology Agency (2007-2008)
 Bruker Excellence in Diffraction Award (for the work performed by graduate students) (twice, 2005,2006)
 Guest Researcher, NIST, Gaithersburg, MD (2004-present)
 NSF Career Award (2001)
 Office of Naval Research, Young Investigator Program Award (2000)
 Oak Ridge Associated Universities Ralph E. Powe Junior Faculty Enhancement Award (2000)
 General Research Board Semester Research Award, University of Maryland (2000)
 Associated Western Universities Postdoctoral Research Fellowship (1996-1999)
 National Center for Electron Microscopy Visiting Scientist Fellowship, Lawrence Berkeley National Laboratory (1999)
 Summer Undergraduate Research Fellowship, Caltech (1985 & 1986)

US PATENTS GRANTED

1. "Low loss composition of $\text{Ba}_x\text{Sr}_y\text{Ca}_{1-x-y}\text{TiO}_3$: $\text{Ba}_{0.12-0.25}\text{Sr}_{0.35-0.47}\text{Ca}_{0.32-0.53}\text{TiO}_3$," No. 6,285,049
 2. "High-throughput thin-film fabrication vacuum flange" No. 7,084,445
 3. "Fabrication of single-chip thin films with continuously graded physical property parameters and their applications to multi-functional monolithic microelectronic/optoelectronic device arrays" No. 7309644
 4. "Method of forming a dielectric thin film having low loss composition of $\text{Ba}_{\text{sub}.x}\text{Sr}_{\text{sub}.y}\text{Ca}_{\text{sub}.1-x-y}\text{TiO}_{\text{sub}.3}$: $\text{Ba}_{\text{sub}.0.12-0.25}\text{Sr}_{\text{sub}.0.35-0.47}\text{Ca}_{\text{sub}.0.32-0.53}\text{TiO}_{\text{sub}.3}$ " No. 6146907
 5. "Tungsten doped thin film materials" No. 6660414
 6. "All thin film ultrasensitive magnetoelectric magnetometers" No. 7345475 B2
 7. "Lead-Free Piezoceramic Materials" No. 8,179,025
- Several others pending.

PROFESSIONAL ACTIVITIES

Guest editorship:

- Applied Surface Science (2007), Proceedings of the 4th International Workshop on Combinatorial Materials Science and Technology
- Measurement Science and Technology, January 2005, Special issue on combinatorial materials science
- IoP Nanotechnology (2014-2016), Special issue on Big Data in Materials Science
- Technical editor of various conference proceedings including IEEE Transactions on Applied Superconductivity (2000) (Proceedings of the 2000 Applied Superconductivity Conference)
- Reviewer for the archival journals: *Applied Physics Letters*, *Physical Review B*, *Physical Review Letters*, *Journal of Applied Physics*, *Review of Scientific Instruments*, *Thin Solid Films*, *Nature Nanotechnology*, *Nature Materials*, *Advanced Materials*. I review 2-3 papers per month for these journals.
- Angel Investors Panel, NIST (2014- present), NIST

Professional Elected Offices/Professional Committee Memberships

- Editorial Advisory Board, npj Computational Materials (2015- present)
- Editorial Advisory Board, Scientific Reports (2015-present)
- Editorial Advisory Board, npj Computational Materials (2015-present)
- Elected member-at-large, Treasurer-Secretary, then Vice Chair/Chair, Executive Committee, Forum on Industrial and Applied Physics, American Physical Society (2012-present)
- Elected member-at-large, User Executive Committee, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory (2011-2013)
- Editorial Advisory Board of ACS Combinatorial Chemistry (2009-present)
- Elected Chair of the Gordon Conference on Combinatorial and High-throughput Materials Science (2002-2004)
- Evaluation Committee, Combinatorial Materials Exploration and Technology Project, Ministry of Science and Technology of Japan (2001- 2004)
- NIST Panel Group on Technology Roadmap for Combinatorial Methods, June 2000
- Materials Informatics Working Group (organized by Pacific Northwest National Lab.), December 2005

Conferences Organized

- MRS Symposia on Combinatorial Materials Science and Functional Materials and other topics: ~1/year
- *The International Workshops on Combinatorial Materials Science and Technology* Held semi-annually. The last one was in October 2015 in Gold Coast, Australia.
- The Second Gordon Research Conference on *Combinatorial High Throughput Materials Science*, January 25-30, 2003, Santa Barbara, CA
- Symposium on Scanning Probe Microscopy techniques, American Ceramic Society's Pacific Rim Meeting, September 11-16, 2005, Maui, HI
- APS March Meetings invited sessions: ~1/year
- Conference on Industrial Applications of Combinatorial Materials Science, February 2015, University of Maryland
- Workshop on Advanced Solid State Cooling, April 2015, University of Maryland
- Machine Learning for Materials Research Boot Camp and Workshop, June 2016, University of Maryland
- Session Chair at 4-5 conferences per year

Professional Memberships

American Physical Society, Materials Research Society, TMS, ASME (affiliate member), ASCE (affiliate member)