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## PUBLICATION • Number of Journal Publications: 24

- ◇ **Samaresh Guchhait\*** and Raymond Orbach, “Magnetic Field Dependence of Spin Glass Free Energy Barriers”, *Physical Review Letters* **118**, 157203 (2017).  
\* *Corresponding author*  
[**First accurate measurement of field dependence of free energy barriers in glass.**]
- ◇ R. Salas, **S. Guchhait**, *et al.*, “Growth rate and surfactant-assisted enhancements of rare-earth arsenide InGaAs nanocomposites for terahertz generation”, *APL Materials* **5**, 096106 (2017).  
[*Study of combined effects of the growth rate and surfactant on the properties of III-V nanocomposites containing rare-earth-monopnictide nanoparticles.*]
- ◇ S. Mozaffari, **S. Guchhait** and J. T. Markert, “Spin-orbit interaction and Kondo scattering at the PrAlO<sub>3</sub>/SrTiO<sub>3</sub> interface: Effects of oxygen content”, *Journal of Physics: Condensed Matter* **29**, 395002 (2017).  
[*Study of the electronic and magnetic properties of PrAlO<sub>3</sub> films grown on TiO<sub>2</sub> terminated SrTiO<sub>3</sub> substrates.*]
- ◇ T. Pramanik, A. Roy, R. Dey, A. Rai, **Samaresh Guchhait**, H. C. P. Movva, C.-C. Hsieh, S. K. Banerjee, “Angular dependence of magnetization reversal in epitaxial chromium telluride thin films with perpendicular magnetic anisotropy”, *Journal of Magnetism and Magnetic Materials* **437**, 72 (2017).  
[*First report of the existence of strong perpendicular magnetic anisotropy in chromium telluride thin films.*]
- ◇ R. Dey, A. Roy, T. Pramanik, **Samaresh Guchhait**, S. Sonde, A. Rai, L. F. Register, and S. K. Banerjee, “Localization and interaction effects of epitaxial Bi<sub>2</sub>Se<sub>3</sub> bulk states in two-dimensional limit”, *Journal of Applied Physics* **120**, 164301 (2016).  
[*Effects of quantum interference and electron-electron interactions in 2D transport of topological insulators.*]
- ◇ S. Majumder, **S. Guchhait**, R. Dey, L. F. Register, S. K. Banerjee, “Large Magnetore-

sistance at Room Temperature in Ferromagnet/Topological Insulator Contacts”, *IEEE Transactions on Nanotechnology* **15**, 671 (2016).

[*Study of magnetoresistance associated with the relative orientation of the ferromagnet and spin-polarized electrons moving on the surface of topological insulator.*]

- ◇ R. Salas, **S. Guchhait**, *et al.*, “Surfactant-assisted growth and properties of rare-earth arsenide InGaAs nanocomposites for terahertz generation”, *Applied Physics Letters* **108**, 182102 (2016).

[*Effects of surfactant-mediated epitaxy on the structural, electrical, and optical properties of fast metal-semiconductor superlattice photoconductors.*]

- ◇ A. Roy, *et al.*, “Structural and Electrical Properties of MoTe<sub>2</sub> and MoSe<sub>2</sub> Grown by Molecular Beam Epitaxy”, *ACS Applied Materials & Interfaces* **8**, 7396 (2016).

[*First report of structural and electrical properties of thin films of molybdenum ditelluride and molybdenum diselenide grown on sapphire substrates by molecular beam epitaxy (MBE).*]

- ◇ **Samaresh Guchhait\*** and Raymond Orbach, “Temperature chaos in a Ge:Mn thin-film spin glass”, *Physical Review B* **92**, 214418 (2015).

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[**First experimental verification of temperature chaos in spin glass.**

**First accurate estimation of temperature chaos critical exponent,  $\zeta$ .**

**Invited talk at APS March Meeting, 2016.]**

- ◇ A. Rai, *et al.*, “Air Stable Doping and Intrinsic Mobility Enhancement in Monolayer Molybdenum Disulfide by Amorphous Titanium Suboxide Encapsulation”, *Nano Letters* **15**, 4329 (2015).

[*Use of high- $\kappa$  dielectric to reduce Schottky-barrier-induced contact & access resistances and enhancement of mobility of monolayer molybdenum disulfide.*]

- ◇ A. Roy, **S. Guchhait**, *et al.*, “Perpendicular Magnetic Anisotropy and Spin Glass-like Behavior in Molecular Beam Epitaxy Grown Chromium Telluride Thin Films”, *ACS Nano* **9**, 3772 (2015).

[*First study of molecular beam epitaxy grown chromium telluride thin films.*]

- ◇ R. Salas, **S. Guchhait**, *et al.*, “Growth and properties of rare-earth arsenide InGaAs nanocomposites for terahertz generation”, *Applied Physics Letters* **106**, 081103 (2015).

[*Studies of electrical, optical, and structural properties of fast photoconductors of  $In_{0.53}Ga_{0.47}As$  containing a number of different rare-earth arsenide nanostructures to tailor its photoconductive properties.*]

- ◇ **S. Guchhait\***, G. G. Kenning, R. L. Orbach, G. F. Rodriguez, “Spin glass dynamics at

the mesoscale”, *Physical Review B* **91**, 014434 (2015).

\* *Corresponding author*

**[Proposes a new model of spin glass which incorporates dimensionality.**

**Also disproved one of the most accepted models in the field.]**

- ◇ **Samaresh Guchhait\*** and Raymond Orbach, “Direct Dynamical Evidence for the Spin Glass Lower Critical Dimension  $2 < d_\ell < 3$ ”, *Physical Review Letters* **112**, 126401 (2014).

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**[First experimental verification of spin glass lower critical dimension.**

**First experimental realization of 2D spin glass state.]**

- ◇ R. Dey, T. Pramanik, A. Roy, A. Rai, **S. Guchhait**, S. Sonde, H. C. P. Movva, L. Colombo, L. F. Register, and S. K. Banerjee, “Strong spin-orbit coupling and Zeeman spin splitting in angle dependent magnetoresistance of  $\text{Bi}_2\text{Te}_3$ ”, *Appl. Phys. Lett.* **104**, 223111 (2014).

[*Temperature dependent magneto-transport studies of  $\text{Bi}_2\text{Te}_3$  thin film with extensive modeling and analysis.*]

- ◇ **S. Guchhait\***, H. Ohldag, E. Arenholz, D. A. Ferrer, A. Mehta, and S. Banerjee, “Magnetic ordering of implanted Mn in HOPG substrates”, *Physical Review B* **88**, 174425 (2013).

\* *Corresponding author*

**[First report of existence of inverted double hysteresis in HOPG.**

**First use of AFM nanocrystals to study magnetic properties of a host substrate.]**

- ◇ **Samaresh Guchhait**, and Hendrik Ohldag, “Putting the Spin on Graphite: Observing the Spins of Impurity Atoms Align”, *Stanford Synchrotron Radiation Lightsource Research Highlights*, February 28, 2014.

- ◇ A. Roy, **S. Guchhait**, S. Sonde, R. Dey, T. Pramanik, A. Rai, H. C. P. Movva, L. Colombo, and S. K. Banerjee, “Two-dimensional weak anti-localization in  $\text{Bi}_2\text{Te}_3$  thin film grown on Si(111)-(7×7) surface by molecular beam epitaxy”, *Appl. Phys. Lett.* **102**, 163118 (2013).

[*Low temperature magneto-transport studies of  $\text{Bi}_2\text{Te}_3$  topological insulator thin films grown by MBE.*]

- ◇ J. Mantey, W. Hsu, J. James, E. U. Onyegam, **S. Guchhait** and S. K. Banerjee, “Ultra-smooth epitaxial Ge grown on Si(001) utilizing a thin C-doped Ge buffer layer”, *Applied Physics Letters* **102**, 192111 (2013).

[*Studies of properties and growth of epitaxial Ge films grown on a thin buffer layer of C doped Ge on Si.*]

- ◇ **Samaresh Guchhait\***, M. Jamil, H. Ohldag, A. Mehta, E. Arenholz, G. Lian, A. LiFatu, D. A. Ferrer, J. T. Markert, L. Colombo and S. K. Banerjee, “Ferromagnetism in

Mn-implanted epitaxially grown Ge on Si (100)", *Physical Review B* **84**, 024432 (2011).

\* *Corresponding author*

**[Study of group IV dilute magnetic semiconductor Ge:Mn.**

**First to show that amorphous phase of Ge:Mn is ferromagnetic, while crystalline phase is not ferromagnetic.]**

- ◇ D. A. Ferrer, **S. Guchhait**, H. Liu, F. Ferdousi, C. Corbet, H. Xu, M. Doczy, G. Bourianoff, L. Mathew, R. Rao, S. Saha, M. Ramon, S. Ganguly, J. T. Markert, and S. K. Banerjee, "Origin of shape anisotropy effects in solution-phase synthesized FePt nanomagnets", *Journal of Applied Physics* **110**, 014316 (2011) and *Virtual Journal of Nanoscale Science & Technology* **24**, July 25, 2011.

[*Study on the effects of shape and magneto-crystalline anisotropy on magnetic and electronic properties of magnetic nanocrystals.*]

- ◇ G. Liang, H. Fang, **S. Guchhait**, C. Hoyt, and J.T. Markert, "Effects of sintering temperature on the superconductivity in Ti-sheathed MgB<sub>2</sub> wires", *Advances in Cryogenic Engineering* **56**, 281 (2010).

[*Study on the effects of sintering temperature on the superconducting properties of Ti-sheathed MgB<sub>2</sub> wires .*]

- ◇ C. Sun, H. C. Floresca, J. G. Wang, J. Mustafa, **S. Guchhait**, D. Ferrer, S. K. Banerjee, G. Lian, L. Colombo and M. J. Kim, "Amorphous Structure and Stability of Mn Implanted GeC Ferromagnetic Semiconductor", *Microscopy and Microanalysis* **15**(S2), 1216 (2009).

[*Structural studies on Mn-doped GeC dilute magnetic semiconductor.*]

- ◇ G. Liang, H. Fang, Z. P. Luo, C. Hoyt, F. Yen, **S. Guchhait**, B. Lv, J. T. Markert, "Negative effects of crystalline-SiC doping on the critical current density in Ti-sheathed MgB<sub>2</sub>(SiC)<sub>y</sub> superconducting wires", *Superconductor Science & Technology* **20**, 697 (2007).

[*Study on the effects of SiC doping on superconducting properties of Ti-sheathed MgB<sub>2</sub>.*]

- ◇ J.-H. Choi, U. Mirsaidov, C. Miller, Y. Lee, **Samaresh Guchhait**, M. Chabot, W. Lu, and J. T. Markert, "Oscillator Microfabrication, Micromagnets, and Magnetic Resonance Force Microscopy", *Proceedings of SPIE: Smart Electronics, MEMS, BioMEMS, and Nanotechnology*, Volume **5389**, page 399-410, July 2004.

[*Report on the advances in nuclear magnetic resonance force microscopy (NMRFM).*]