



The 2020 Around-the-Clock Around-the-Globe Magnetics Conference: Invited speakers information

Name: Guohan
Surname: Hu
Affiliation: IBM TJ Watson Research Center
Country: USA



Title of the talk: Materials for STT-MRAM Applications

Biography:

Guohan Hu is a Principal Research Staff Member and Manager of the MRAM Materials and Devices group at the IBM T. J. Watson Research Center. Guohan received a B. S. degree in Materials Science & Engineering and a B. S. degree in Economics from Tsinghua University in 1997. Guohan received her Ph.D. degree in Materials Science and Engineering from Cornell University in 2002. Her research has been on MRAM materials and devices, magnetic oxide thin films, and patterned media.

Abstract:

Spin Transfer Torque Magnetic Random Access Memory (STT-MRAM) is a type of emerging memory which holds the promise of high speed, high endurance, non-volatility, and good scalability. Since the theoretical prediction of the STT switching mechanism in 1996, significant progress has been made in the field, largely through materials innovations. This talk will review the key materials discoveries that enabled the advancement of STT-MRAM technology, including the theoretical prediction and experimental realization of large tunneling magneto-resistance (TMR) with MgO tunnel barrier and the discovery of CoFeB based materials with interfacial perpendicular magnetic anisotropy (iPMA). We will also discuss our recent results at IBM on demonstration of reliable 2 ns switching of STT-MRAM devices [1], and methods to lower the device switching current [2], using optimized magnetic materials.

References:

- [1] G. Hu et al., "Spin-transfer torque MRAM with reliable 2 ns writing for last level cache applications", *IEDM Tech. Dig.*, 38-41 (2019).
- [2] G. Hu et al., "STT-MRAM with double magnetic tunnel junctions", *IEDM Tech. Dig.*, 668-671 (2015).