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Recent Advances in Memory Materials and Devices

Guest Editor:

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closed (30 November 2023)

Message from the Guest Editor

Dear Colleagues,

Significant progress has been made in semiconductor memory, especially phase-change memory (PCM) based on heterostructure and superlattice structure materials, which have attracted considerable attention due to their excellent performance. Phase-change heterostructure (PCH) can overcome the low-precision bottleneck that limits multibit storage and parallel computing in conventional PCM, offering novel physical and chemical properties for semiconductor memory devices.

The development of a new heterostructure for PCM and ovonic threshold switch (OTS) is necessary for their emerging practical device applications. For instance, $Sb_2Te_3/TiTe_2$, the multilayer PCH architecture was designed for two-dimensional (2D) phase transitions in nanometer-thick Sb_2Te_3 phase-change material sublayers that are clamped by confinement $TiTe_2$ sublayers, enabling well-controlled cumulative/progressive SET (crystallization) and iterative/stepwise RESET (amorphization) operations.

We invite contributions of research articles and review on topics including but not limited to the theoretical calculation, synthesis, characterization, and application of novel heterostructures for PCM or OTS.

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Editor-in-Chief

Message from the Editor-in-Chief

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