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Nanostructured multiferroic materials for optoelectronics and energy-related nanodevices RIAD NECHACHE, NAST Center & Department of Chemical Science and Technology, U. of Rome Tor Vergata, ENRICO TRAVERSA, International Research Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), SILVIA LICOCCIA, NAST Center & Department of Chemical Science and Technology, U. of Rome Tor Vergata, FEDERICO ROSEI, Centre Énergie, Matériaux et Télécommunications, INRS — Combining properties into multifunctional materials is one of innovative ways explored by the modern technology to achieve high miniaturization of integrated devices. In this context, besides their exciting physics, multiferroic materials hich combine two or more ferroic order offer opportunities for potential applications in emerging fields of spintronics, optoelectronics and data storage. For such applications, successful integration of these multifunctional materials needs to develop adequate fabrication processes and to the coexistence in singe phase of robust properties at room temperature (RT). Furthermore, a synergistic interaction between magnetic and electric orders leads to additional freedom for designing related devices. Here we review recent progress of our group in growth and nanopatterning of multiferroic thin films developed to overcome those drawbacks. We will present the fabrication of RT-multiferroic Bi_2FeCrO_6thin films. Successful nanopatterning of these complex oxides by a versatile and generic approach and their photovoltaic properties will be also discussed.

Riad Nechache
NAST Center & Department of Chemical Science and Technology,
U. of Rome Tor Vergata

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