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I3.302 Creating green nanostructures and nanomaterials for advanced energy nanodevices

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Securing safe and cheap energy and using it effectively is a serious problem for modern society. As a solution to this, he is performing research on innovative green nanodevices. We are developing power generating devices, storage devices, low-power-consumption devices, multifunction Nano-devices and nano-energy systems that use these devices. To manufacture these nanodevices, it is necessary to be able to do so precisely without damaging the nanostructures and to derive the intrinsic characteristics of the nanomaterials and nanostructures. For the first time, such devices are made possible through the mastery of our unique intelligent nano-processes such as a super-low-damage neutral beam processes, pulsed plasma processes, and ultimate processing utilizing biotechnology.
In this paper, we focuse on bio-template and neutral beam etching fusion top-down process to realize nanoscale structures. The optical, electrical, spintronics and phononic characteristics have been already demonstrated in nanoscale structures. Our fabricated nanostructure can precisely control the transport of electron, hole, spin and phonon by diameter, hight, gap and interlayer materials of nanostructure respectively. Now, based on these results, we are trying to develop QN solar cells, QN thermo-electric conversion elements, QN Laser/LED, QN spin devices and so on.

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Presenter: SAMUKAWA, S. (EPS 2019)

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