

NANO HIGHLIGHT
Center for Scalable and Integrated Nanomanufacturing

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NSF has awarded major support to establish the Center for Scalable and Integrated NanoManufacturing (SINAM). SINAM is targeting a new nanomanufacturing paradigm based on fundamental scientific research; one that will enable an industrial quantum-leap by working closely with industry; and that will forge a new education platform for multidisciplinary science and engineering through integrating research and education. The nanomanufacturing technologies to be developed by SINAM promise to find applications in diverse industries, including computing, telecommunications, biomedicine, and homeland security.

Located at the University of California at Los Angeles (UCLA), SINAM involves five other partner institutions: the University of California-Berkeley, Stanford University, the University of California-San Diego, the University of North Carolina at Charlotte, and HP labs.

SINAM's research will be focused among several core nanomanufacturing technologies, including the Plasmonic Imaging Lithography and Ultramolding Imprint Lithography aiming toward critical resolution of 1-10nm and the hybrid top-down and bottom-up technologies to achieve massively parallel integration of heterogeneous nanoscale components into higher-order structures and devices. To make the innovative nanomanufacturing processes commercially viable, SINAM will develop system engineering strategies to scale-up the nanomanufacturing technologies with high throughput and high yield.

SINAM's new manufacturing paradigm to be developed will have wide and profound impacts on human life experience through many different applications. Among them, SINAM's research has been focused on integrated nano-photonics, molecular-electronics, and biosensing technologies. By fabricating the electronic or photonic circuit at an increasingly smaller scale, the nanoscale devices can be manufactured with lower cost, smaller dimension, and higher power efficiency. On the other hand, utilizing the SINAM nanomanufacturing technology, the bio-sensors can efficiently convert photonic and chemical energy into electronic transport, locomotion, or into energy storage. Such development would lead to efficient molecular sensing, nano-motors, nano-fuel cells, nano-pumps and photonic energy storage/conversion devices.

Like other NSECs, SINAM will devote extensive efforts to building a skilled nanomanufacturing workforce, with special emphasis on recruitment of women and underrepresented minorities. Cooperation with industrial partners is another SINAM priority. Almost a dozen companies have already joined the SINAM Industrial Consortium and international collaboration will involve academic and industrial nanotechnology groups in Germany, Japan, the Netherlands, and the United Kingdom.

References

For further information about this project link to <http://www.sinam.ucla.edu> or email SINAM@microlab.seas.ucla.edu