

# 20<sup>th</sup> World Summit on Nanotechnology and Expo

October 05-06, 2018 | Los Angeles, USA

## Crystal structure changes of $\text{CoFe}_2\text{O}_4$ nanoparticles studied using high-pressure synchrotron x-ray diffraction

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Super paramagnetic iron oxide nanoparticles (SPIONS) are important to a variety of fields, from materials engineering to medicine. Nanoparticles often have chemical and structural properties unique from their bulk counterparts. As such, much more can be learned from the structural response of nanoparticles to varying thermodynamics parameters like pressure. We present the results of a high-pressure synchrotron x-ray diffraction study of  $\text{CoFe}_2\text{O}_4$  nanoparticles (APS 30nm), conducted at Advanced Photon Source, Argonne National Laboratory. Static compression to 54GPa was achieved with the use of a diamond anvil cell (DAC). Crystal structure evolution from the refinement of x-ray diffraction patterns indicates a structural change induced by the application of pressure. The behavior of  $\text{CoFe}_2\text{O}_4$  nanoparticles is compared to other SPIONS, as well as bulk  $\text{CoFe}_2\text{O}_4$ .

### Biography

Surya Suvvari is a Green Valley High School, Junior. He worked as a summer student in UNLV doing nanomaterials research. He was as part of a 4 member team to represent his school at The Shalheveth Freier International Physics Tournament in Israel. His current interests include the application of Physics, Maths and Technology to Health Sciences.

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