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2016

## Additive Manufacturing Group at Naval Postgraduate School

Sadagic, Amela; Brutzman, Don

Monterey, California. Naval Postgraduate School

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# Additive Manufacturing Group at Naval Postgraduate School



NAVAL  
POSTGRADUATE  
SCHOOL

## Modeling, Virtual Environments and Simulation (MOVES) Institute

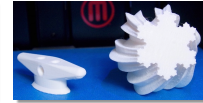
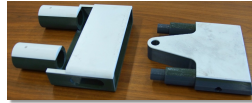
Faculty members: Dr. Amela Sadagic, Dr. Don Brutzman

Student: Capt Matthew Friedell

Project: CAD Interoperability for Navy Reuse in 3D Printing, Maintenance and Training



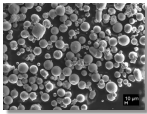
3D scanning (images above), and 3D printing (images below)



Maintenance scenario at CGC HAWKSBILL



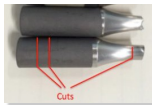
SPIDERS3D application



Scanning electron micrograph of raw powders



Optical Microscopy showing phase distribution in printed coupon



Laser sintered coupons

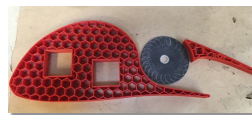
## Mechanical and Aerospace Engineering Department

Faculty member: Dr. Claudia Luhrs, Student: LT Cody Colyer

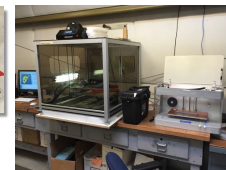
Project: Microstructural Analysis and Comparative Study of Powders Used in 3D Metal Printing

Faculty member: Dr. Garth Hobson

Project: Turbopropulsion Laboratory 3D printing capabilities



Mold pattern of a modified Goettingen Airfoil



3D printers

## Energy Academic Group

Faculty member: Dr. Jonathan Phillips

Student: LT Sam Lowell

Project: Sub-Micron Scale Samarium-Cobalt (Sm<sub>2</sub>Co<sub>17</sub>) Magnetic Powder Synthesized Using Reduction Expansion Synthesis Method (with Dr. C. Luhrs)

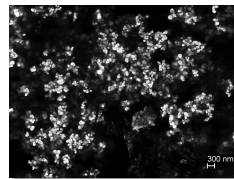
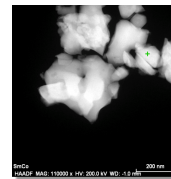
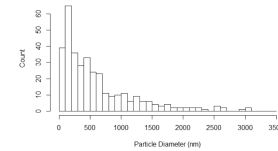


Image from Zeiss Neon 40 Field Emission Scanning Electron Microscope



'High magnification' (FEI Tecnai Osiris 200 kV S/TEM)

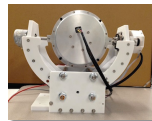


Particle size distribution

## Space Systems Academic Group

Faculty member: Dan Sakoda

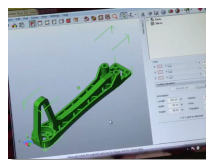
3D printed items in support of NPS research projects



## Center for Asymmetric Warfare

Faculty member: Alan Jaeger, Brendan Applegate

Student: Mathew Sheehan



Making of UAV quadcopter onboard USS ESSEX



POCs: Dr. Amela Sadagic ([asadagic@nps.edu](mailto:asadagic@nps.edu)) and Dr. Don Brutzman ([brutzman@nps.edu](mailto:brutzman@nps.edu))

Wiki: [https://wiki.nps.edu/display/ADDM/Additive+Manufacturing+\(AM\)](https://wiki.nps.edu/display/ADDM/Additive+Manufacturing+(AM))

Schools: GSEAS, GSOIS and Research Office