

APPLIED RESEARCH CENTER

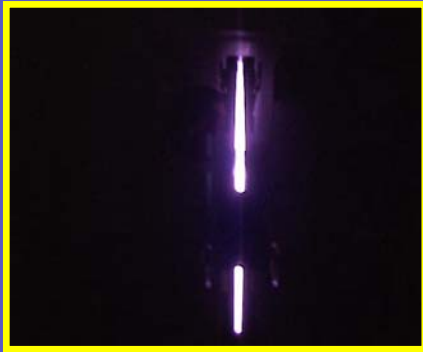


— HIGH-TECH SOLUTIONS —

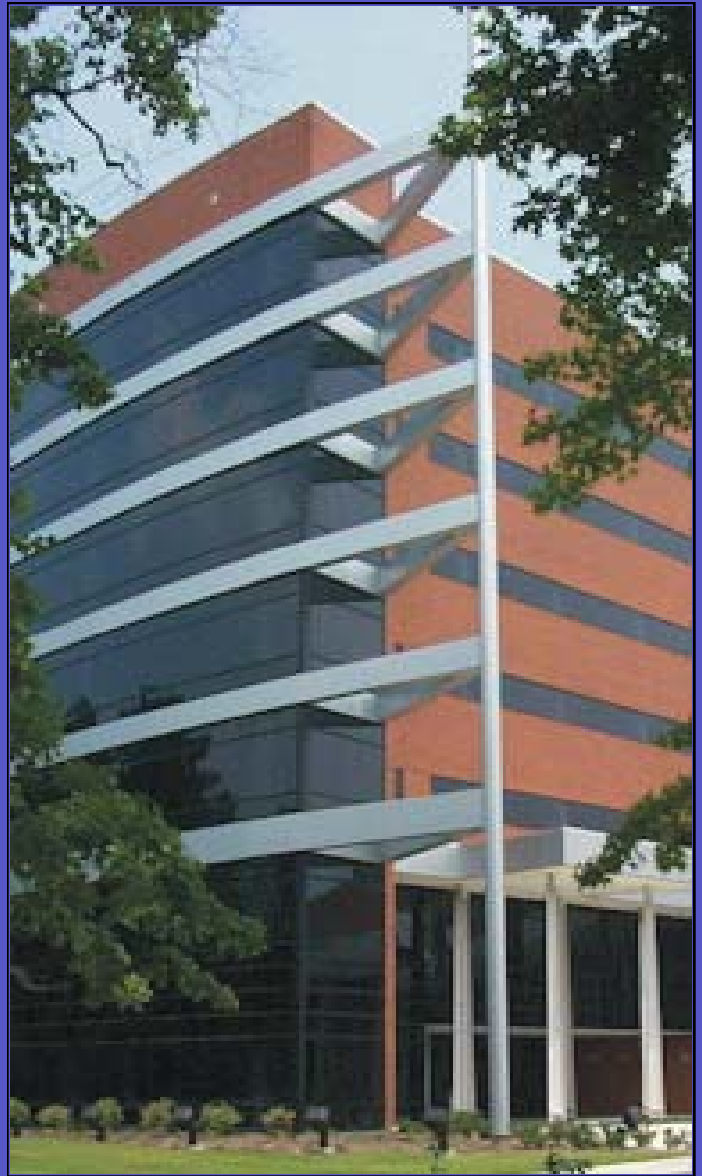
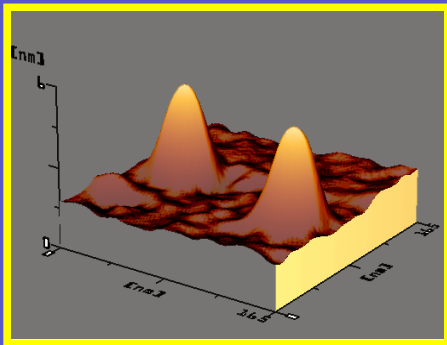
LASER



PLASMA



NANOTECHNOLOGY



Applied Research Center
College of Engineering & Technology
Old Dominion University
Newport News, Virginia



A Carnegie Doctoral/Research Extensive Institution

Mission

To be the leader in research, development and education concentrating on laser and plasma applications and advanced materials.



Working to Innovate

What we are doing:

- Negative Electron Affinity Photocathodes
- Surface Modification with Plasmas
- Carbon Nanotubes and Nanoparticles
- Advanced Nanocomposite Polymeric Materials
- Damage Limits of Materials
- Femtosecond Laser Technology
- Laser Sintering
- Field Emission
- VUV Lithography
- Photoacoustics
- Solar Cells
- Nanotechnology/Quantum Dots
- Electro-Optic Devices
- Advanced Sensors
- Laser Micromachining
- Materials Characterization
- Thin Films

In the Laboratory

ARC has established 18 labs with equipment and facilities valued in excess of \$5 million.

COATINGS

Multi-Target Sputtering
Laser Ablation
ECR Plasma Enhanced
Chemical Vapor Deposition
Electron Beam
Evaporation
Ultra High Vacuum
Deposition
Plasma and Ion Beam
Deposition
Ion Beam Etching System
Photolithography

LASERS

Femtosecond
System
CW Ti: Sapphire
High Power Diode
High Power UV
High Power Nd:YAG
CO₂
Excimer
Argon Ion

MATERIALS ANALYSIS

Scanning / Transmission
Electron Microscope (SEM/TEM)
Optical Microscope
Atomic Force Microscope (AFM)
Scanning Tunneling Microscope
(STM)
X-Ray Photoelectron
Spectroscopy (XPS)
Time-Of-Flight Mass
Spectrometer
Raman & Optical
Spectrophotometer
Ellipsometer
X-ray Diffractometer, Tensile
Tester

With Our Clients



Department of Energy—Time Resolved Studies of Surface Reactions, Pulsed Laser Deposition



National Science Foundation—Time Resolved Electron Diffraction, Scanning Tunneling Microscopy Studies, Nanocrystals



Invista—Fs Laser micromachining



Eastman Kodak—Electro-optic devices



Framatome ANP—Laser shock processing



Jefferson Lab—Nanostructures/field emission, Photocathodes



Luna Innovations—C60



Philip Morris—Nanocatalysts



Varian Vacuum—Field emission



Vistakon—AFM studies



Xerox—UHV



BP Solar—Solar cells



AFOSR—Plasma, Scanning Electron Microscopy Studies



Army—VUV lithography



CIT—Plasma processing



DARPA—VUV lithography



NASA-Langley—Composites, Photoacoustics, Quantum Dot Detectors, LIDAR



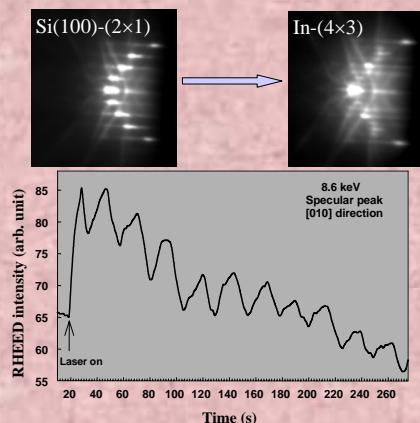
Navy—Ti Tubing Damage Limits



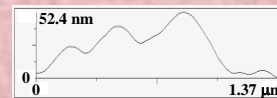
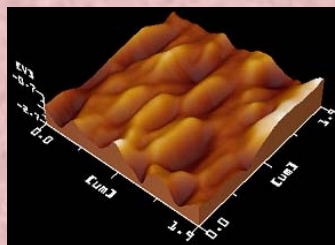
National Institute of Aerospace—IR Detectors



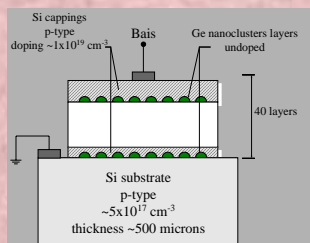
RHEED intensity during growth of In-(4x3) film



INP on GaAs (100)



IR Ge/Si QD Photodetector by Pulsed Laser Deposition



Femtosecond Laser



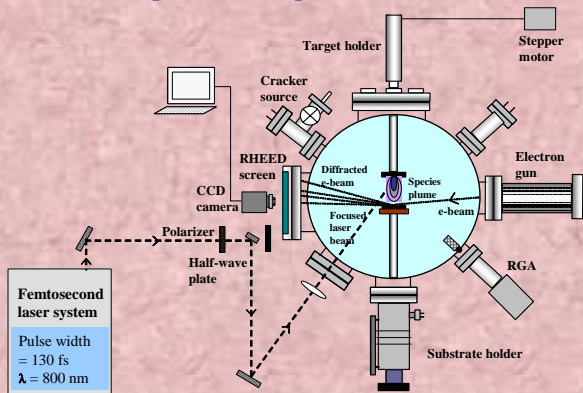
Atomic Layer Deposition Reaction Chamber



Pulp Station for electrical device testing and Agilent B1500A Semiconductor Device Analyzer



Pulsed Laser Deposition Setup



LASER AND PLASMA APPLICATIONS

Basic Sciences:	Self-assembled Quantum Dots, Phase Transitions, Interferometry, Atomic Cooling, Spectroscopy, Friction Reduction, Nanostructures, Functionalization
Environmental:	Paint Removal, Waste Treatment, Sensors
Industrial:	Micro-Welding, Precision Cutting, Micro-Welding, Drilling, Hardening, Marking, Engraving, Melting, Alloying, Cladding, Rapid Prototyping, Shock Processing, Texturing, Forming, Annealing, Sintering, Adhesion, Stress Measurements, Enhanced Wettability, Nonwetting Surfaces
Instrumentation:	Movement, Range Finder, Holography, Surveying, Photoacoustics, Thin Film Sensors
Semiconductor:	Lithography, Thin Films, Crystallization, Surface Cleaning, Annealing, Doping, Printer and Bar Code Scanners, Sensors, Printed Circuit Boards, Photovoltaics, Adhesion, Micromachining, Enhanced Wettability, Nonwetting Surfaces
Telecommunications:	Optical Storage, Laser Communications, Electro-Optic Devices

The ARC is in an excellent strategic position to accomplish its mission. It is only a few hours away from Washington D.C., eight miles from NASA, surrounded by Department of Defense campuses and within walking distance to the Jefferson National Accelerator Facility. Our many industry partners are also within an hour's drive from the facility

What We Do

We offer research in laser, plasma, advanced materials research and technology conducted by faculty and graduate students. We provide time and cost saving technologies to our clients as well as educational opportunities and state-of-the-art research experiences for students.



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