



FLORIDA INTERNATIONAL UNIVERSITY

DOE-EM Cooperative Agreement

FIU Year 5 Research Review



Presented: March 31 - April 3, 2015
to the U.S. Department of Energy
Dr. Leonel Lagos, PhD, PMP® (Principal Investigator)





FIU-DOE Research Review



Tues, March 31	Wed, April 1	Thurs, April 2	Fri, April 3
<p>10:00 AM - 12:00 PM <i>Presentation- Env. Remediation Technologies (FIU Project 3)</i> Discussion of research area in support of EM</p> <p>1:00 - 3:00 PM <i>Presentation- Env. Remediation Technologies (FIU Project 2)</i> Discussion of research area in support of EM</p>	<p>10:00 AM - 12:00PM <i>Presentation- Workforce Development and Training (FIU Project 5)</i> Discussion of research area in support of EM</p> <p>1:00 - 3:00 PM <i>Presentation- D&D and Env. Mngt IT Research (FIU Project 4)</i> Discussion of research area in support of EM</p>	<p>1:00 - 3:00 PM <i>Presentation- High Level Waste/Waste Processing Research (FIU Project 1)</i> Discussion of research area in support of EM</p>	<p>10:00 AM - 12:00 PM <i>Wrap-up - Discussion of DOE-FIU Cooperative Agreement</i></p>



FLORIDA INTERNATIONAL UNIVERSITY



DOE-FIU Science & Technology Workforce Development Program

Presented by: Dr. Leonel Lagos
ARC Director of Research
Director, DOE Fellows Program





Project Staff and Students



Program Director: Leonel Lagos, PhD, PMP[®]

Faculty/Staff: Peggy Shoffner, Angelique Lawrence, Walter Quintero

And.....Our DOE Fellows





Pacific Northwest
NATIONAL LABORATORY

 **Lawrence Livermore**
National Laboratory



Battelle



washingtonriver
protectionsolutions



SRNL
SAVANNAH RIVER NATIONAL LABORATORY





Program Description

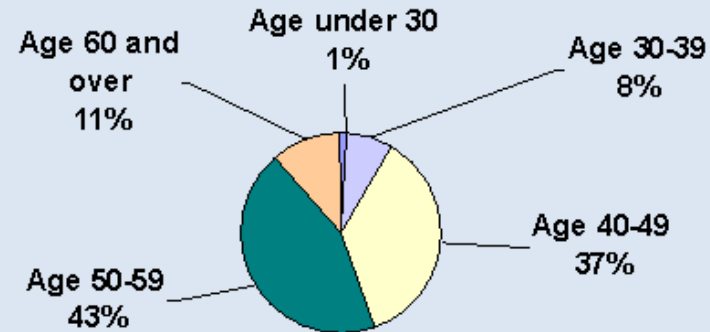
FIU's Applied Research Center (ARC) and the US Department of Energy's Office of Environmental Management have established a workforce development program for the training of FIU STEM, minority students in an effort to create a ***pipeline*** of scientists and engineers that will enter DOE's workforce upon completing their degrees and research at FIU.





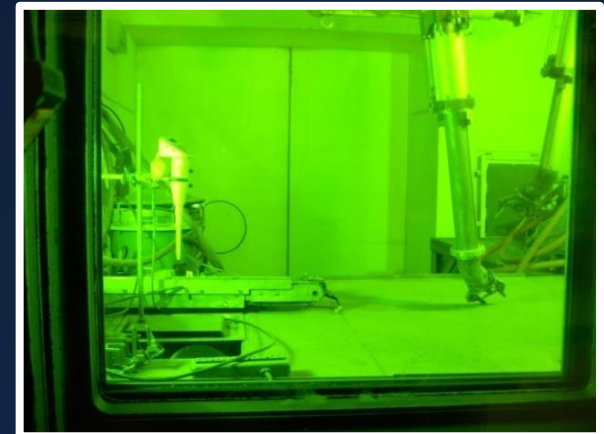
DOE EM Workforce

- Age 40 and above:
91% of EM's workforce
- Age 30-39:
8% of EM's workforce
- Age 30 and below:
1% of EM's workforce





DOE EM Environmental Challenges 60 Year Legacy of R&D and Production of Nuclear Weapons





Project 1 – DOE Fellows Support



DOE Fellow	Program	Project - Subtask	Project Title
Anthony Fernandez	Undergraduate	Project 1 – Subtask 2.1	Development of Alternative Unplugging Technologies
John Conley	Undergraduate	Project 1 – 19.2	Evaluation of Nonmetallic Components in the Waste Transfer System
Maximiliano Edrei	Undergraduate	Project 1 – 17.2	CFD Modeling of HLW Processes in Waste Tanks
Brian Castillo	Undergraduate	Project 1 – Subtask 19.1	Pipeline Corrosion and Erosion Evaluation
Dayron Chigin	Graduate (Masters)	Project 1 – Subtask 18.1	Evaluation of FIU's SLIM for Rapid Measurement of HLW Solids on Tank Bottoms
Ryan Sheffield	Undergraduate	Project 1 – Subtask 18.2	Development of Inspection Tools for DST Primary Tanks



Project 2 – DOE Fellows Support



DOE Fellow	Program	Project Task	Project Title
Claudia Cardona	Graduate (PhD)	Project 2 – Task 1.1	Sequestering Uranium at the Hanford 200 Area Vadose Zone by In Situ Subsurface pH Manipulation Using NH ₃ Gas
Robert Lapierre	Graduate (M.S.)		
Hansell Gonzalez	Graduate (PhD)	Project 2 – Task 2.3	Sorption properties of humate injected into the subsurface system
Christian Pino	Undergraduate	Project 2 – Task 2.1 (Carry over)	FIU's Support for Groundwater Remediation at SRS F/H –Area
Christine Wipfli	Undergraduate	Project 2 – Task 2.1	
Aref Shehadeh	Undergraduate	Project 2 – Task 2.2	Monitoring of U(VI) bioreduction after ARCADIS demonstration at F-Area
Kiara Pazan and Christian Pino	Undergraduate	Project 2 – Task 3	Evaluation of ammonia fate and biological contributions during and after ammonia injection for uranium treatment



Project 3 – DOE Fellows Support



DOE Fellow	Program	Project Task	Project Title
Kiara Pazan	Undergraduate	Project 3 – Task 1	Modeling of the migration and distribution of natural organic matter injected into subsurface systems
Natalia Duque	Graduate (Masters)	Project 3 – Task 2	Surface Water Modeling of Tims Branch
Yoel Rotterman	Undergraduate	Project 3 – Task 3	Sustainability Plan for the A/M Area Groundwater Remediation System



Project 4 – DOE Fellows Support



Doe Fellow	Program	Project Task	Project Title
Jesse Viera	Undergraduate	Project 4 – Task 2	D&D Support to DOE EM for Technology Innovation, Development, Evaluation and Deployment
Janesler Gonzalez	Undergraduate	Project 4 – Task 2	
Meilyn Planas	Undergraduate	Project 4 – Task 2	
Andrew De La Rosa	Graduate (Masters)	Project 4 – Task 3	D&D Knowledge Management Information Tool (KM-IT)
Jorge Deshon	Undergraduate	Project 4 – Task 3	
Steve Noel	Undergraduate	Project 4 – Task 3	



DOE-FIU Cooperative Agreement

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"Working together for a safer and cleaner environment."

Dr. Leonel E. Lagos, Principal Investigator



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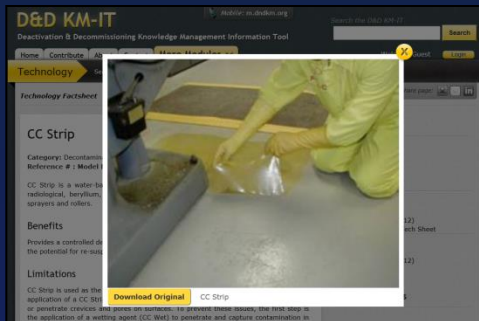
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ARC Committed to Support and Advance the DOE EM Environmental Restoration Mission



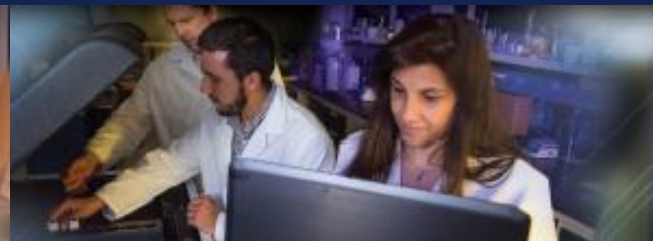
- Deactivation & Decommissioning (D&D) of Contaminated Facilities
- Soil & Groundwater Modeling & Remediation
- Radioactive Waste Management & Treatment
- Information Technology Tools for Environmental Application
- STEM Workforce Development and Training





Program's Components

- Paid 10-week summer internships at DOE national laboratories, DOE sites, DOE-HQ or DOE contractors working under the supervision of DOE scientists (mentors)
- Paid 20 hours/week Student Research Assistantship at ARC during school year
- Research experience with ARC scientists at FIU during school year: one-on-one mentoring performing “**hands on**” DOE-related applied research
- 2 - 4 years Developmental Training Program (depends on Masters or PhD track)
- DOE Lecture Series and technical seminars
- Participation in conferences/workshops (Waste Management, ANS, etc.)
- Tuition waiver for graduate studies (Masters, PhDs)





Eligibility Requirements

- United States Citizens/Permanent Resident Aliens
- Minimum 3.0 grade point average
- Two letters of recommendation from faculty members
- Fill out Program's application (<http://fellows.fiu.edu>)
- FIU undergraduate and graduate students
- Must be available to participate in program activities (summer internships, conferences, weekly meetings)





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DOE-FIU Science & Technology Workforce Development Program

Accomplishments





DOE Fellows Training at FIU

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DOE Fellows Induction Ceremony



Since 2007, a total of 8 Induction Ceremonies have been conducted

A total of 108 FIU STEM students have been inducted as DOE Fellows





DOE Fellows Conference Participation & Presentations



Active participation in DOE related conferences including Waste Management Symposia, ANS, IEEE, and ICEM13 conferences

Our Fellows have presented over 140 papers/posters and have obtained 1st place at WM's Professional Poster Track (Leydi Velez) and at 5 Student Poster Competitions (Denisse Aranda, Danny Carvajal, Stephen Wood, Alexandria Fleitas, Christine Wipfli)





Fellows at WM15





DOE Fellows 10-week Internships Across the Complex

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80 internships completed



DOE Fellows Poster Exhibitions

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Major Accomplishments

- **108** students recruited/inducted as DOE Fellows since program inception in 2007. An additional **15** will be inducted this afternoon.
- **8** Fellows hired by DOE, DOE national labs, and DOE contractors.
- **13** Fellows hired by other federal, state, and local gov't agencies (Dept. of Defense, NASA, Dept. of Commerce, Dept of the Navy (NAVSEA), etc.).
- **41** Fellows hired by STEM industry (GE, Lockheed Martin, Raytheon, Texas Instruments, Motorola, Florida Power & Light, Boeing, Inter Corporation, MWH Global Inc., and others) .
- Won **one (1)** Best Professional Poster (Leydi Velez) and **four (4)** Best Student Posters (Denisse Aranda, Danny Carvajal, Stephen Wood, Alexandria Fleitas) at Waste Management Symposia since 2008.
- **80** internships completed at DOE sites, DOE national labs, DOE-HQ, and DOE contractors across the Complex.





Major Accomplishments

- Presented over **140** papers and posters at Waste Management (2008-2014) and other national/international conferences, including two (**2**) presentations at ICEM13 (Brussels, Belgium), and **5** at ANS conference
- Waste Management Symposia Best Student Posters awarded to Christine Wipfli (WM15), Alexandra Fleitas (WM14), Stephen Wood (WM11), Denny Carvajal (WM10) and Denisse Aranda (WM09). Best Overall Professional Poster awarded to Leydi Velez (WM09)
- **35** Fellows started program as undergraduates and continued to obtain a Masters and/or PhD degree at FIU
- Other DOE Fellows have obtain bachelors degrees at FIU and continued their graduate education at MIT, Michigan, Purdue, Stanford, Virginia Tech, and other institutions



STEM Minority Students Pipeline





DOE Fellows Having Fun & Helping the Community



Phoenix, Arizona



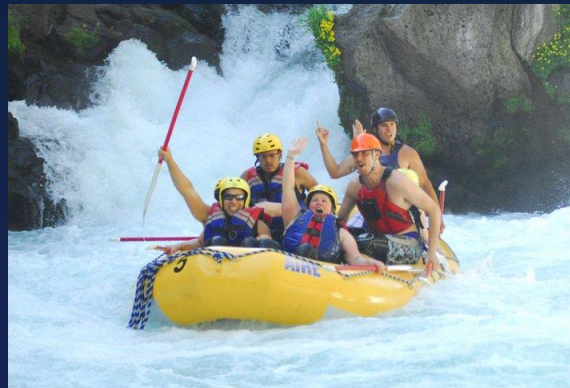
Great Smoky Mountains, TN



Beach Cleanup, Key Biscayne FL



Snowbowl Mountain, AZ



White Salmon, Washington



DOE Fellows Christmas Party 2009

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FIU Science and Technology Workforce Development Initiative

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DOE Fellows - Posters

- Malware Forensics on Mobile Devices for DOE-EM Applications - **Andrew De La Rosa** (DOE Fellow, Florida International University)
- Enraf^(R) Reference Level Updates for High-Level Nuclear Waste Tanks at Hanford Site - **Anthony Fernandez** (DOE Fellow, Florida International University)
- Monitoring Mineralogical Changes Occurring in Savannah River Site F-Area Sediments via Enhanced Anaerobic Reductive Precipitation Process - **Aref Shehadeh** (DOE Fellow, Florida International University)
- Erosion & Corrosion Analysis from POR104 Valve Box at Hanford - **Brian Castillo** (DOE Fellow, Florida International University)
- Use of x-ray fluorescence to Characterize Pre-Hanford Orchards in the 100-OL-1 Operable Unit - **Christian Pino** (DOE Fellow, Florida International University)
- Sodium Silicate Treatment for U(VI) Bearing Groundwater systems at F/H Area at Savannah River Site - **Christine Wipfli** (DOE Fellow, Florida International University)
- Residual Waste Imaging in High Level Waste Mixing Tanks - **Dayron Chigin** (DOE Fellow, Florida International University)
- Study of an Unrefined Humate Solution as a Possible Remediation Method for Groundwater Contamination at Savannah River Site's F/H Area - **Hansell Gonzalez** (DOE Fellow, Florida International University)
- Innovative Applications and Demonstration of Advanced Fogging Technologies to Address Loose Contamination at Savannah River Site's 235F Facility - **Jesse Viera** (DOE Fellow, Florida International University)
- Non-Invasive Pipeline Unplugging Technology for Hanford High-Level Waste Asynchronous Pulsing System - **John Conley** (DOE Fellow, Florida International University)



DOE Fellows - Posters

- Best Practices Mobile Application for D&D KM-IT - **Jorge Deshon** (DOE Fellow, Florida International University)
- Knowledge Management Information Tool Analytics with Distributed Database Engine - **Kavitha Megalageri** (Graduate Research Assistant, Florida International University)
- Column Testing of the Migration and Distribution of Humate Injected into Subsurface Systems at Savannah River Site's F/H Area - **Kiara Pazan** (DOE Fellow, Florida International University)
- D&D Decision Model and Mobile Application for Selection of Fixative, Strippable Coating, and Decontamination Gel Products - **Meilyn Planas** (DOE Fellow, Florida International University)
- Quantitative Assessment of Sustainable Remediation Options for SRS - **Natalia Duque** (DOE Fellow, Florida International University)
- Studying the Ammonia Gas (NH₃) Injection Methodology Proposed for Remediation of the Hanford Deep Vadose Zone - **Robert Lapierre** (DOE Fellow, Florida International University)
- Miniature Motorized Inspection Tool for Department of Energy Hanford Site Tank Bottoms - **Ryan Sheffield** (DOE Fellow)
- A study of Ca-Autunite dissolution in the presence of Shewanella Oneidensis MR1 and different bicarbonate concentrations - **Sandra Herrera** (Graduate Research Assistant, Florida International University)
- Deactivation and Decommissioning Web Log Analysis using big data technology- **Santosh Joshi** (Graduate Research Assistant, Florida International University)
- D&D Knowledge Management Information Tool Feasibility Study for Cross-Platform Mobile Applications - **Steve Noel** (DOE Fellow, Florida International University)



DOE Fellows Video



The DOE Fellows Experience Video

