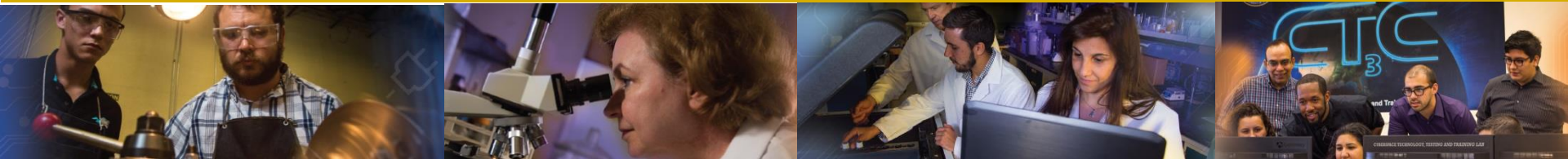




DOE-EM Cooperative Agreement FIU Performance Year 6 Research Review

Presented: April 5 - April 7, 2016
to the U.S. Department of Energy
Dr. Leonel Lagos, PhD, PMP® (Principal Investigator)





FIU-DOE Research Review



Tuesday April 5, 2016	Wednesday April 6, 2016	Thursday April 7, 2016
1:00-2:30 High Level Waste / Waste Processing (FIU Project 1)	10:00-12:00 Workforce Development & Training (FIU Project 4)	10:00-12:00 Wrap Up (All Projects)
2:30-4:00 D&D/IT for EM (FIU Project 3)	1:00 - 3:00 Soil/Groundwater (FIU Project 2)	



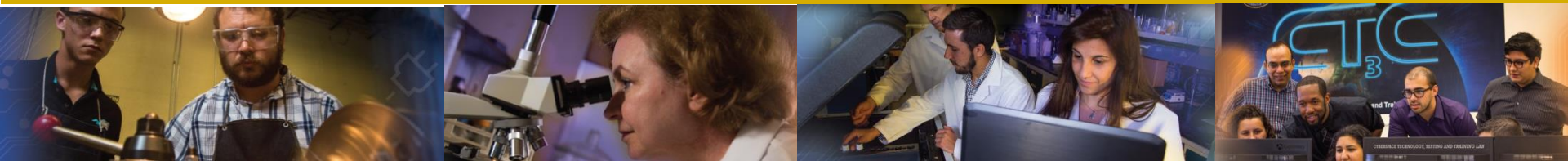
FIU
Applied Research
Center

solution driven

DOE-FIU Science & Technology Workforce Development Program

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

FLORIDA INTERNATIONAL UNIVERSITY





Project Staff and Students



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

Faculty/Staff: Ravi Gudavalli, Peggy Shoffner,
Angelique Lawrence, Walter Quintero, Jose
Rivera

And.....Our DOE Fellows



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Pacific Northwest
NATIONAL LABORATORY

**Lawrence Livermore
National Laboratory**

Y-12
National Security Complex



Battelle

SULLIVAN

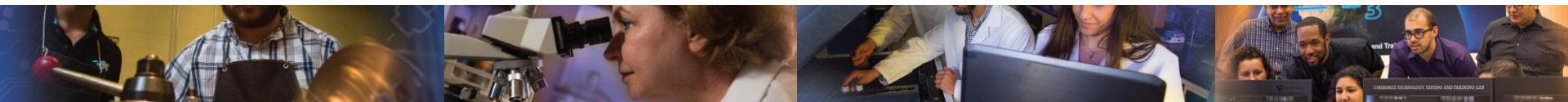
**OAK
RIDGE**
National Laboratory



washingtonriver
protectionsolutions



SRNL
SAVANNAH RIVER NATIONAL LABORATORY





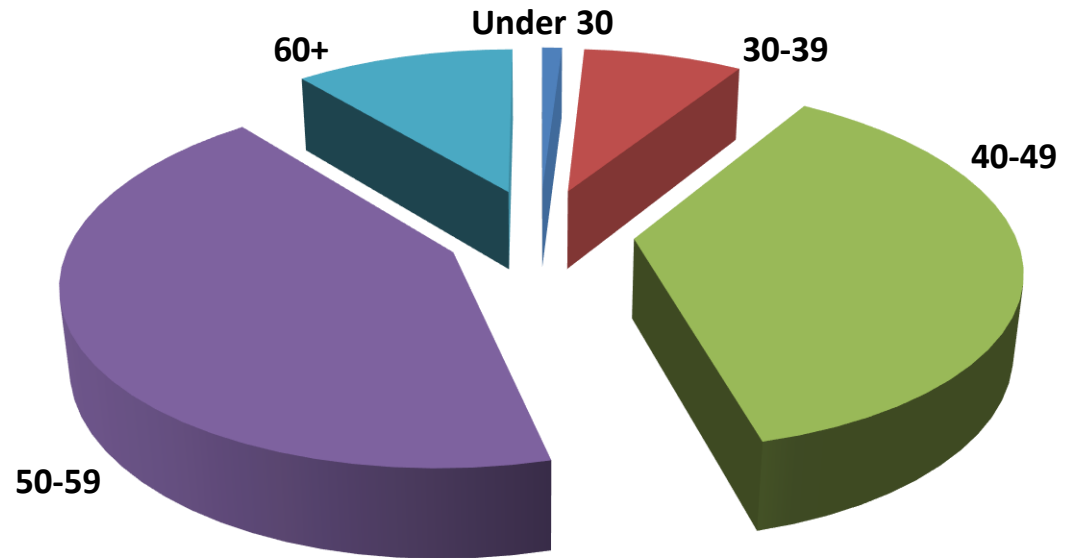
Program Description

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.



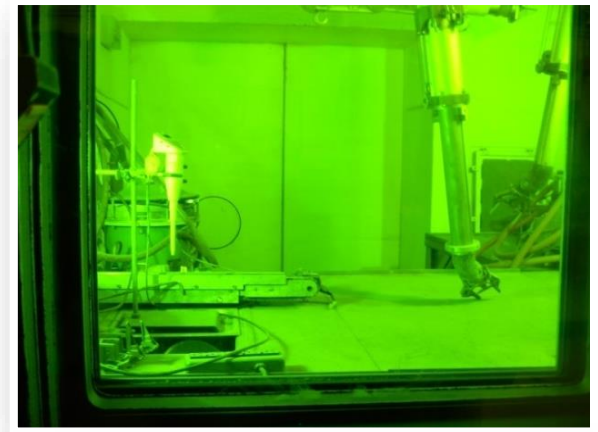
DOE EM Workforce

- 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	Classification	Major	Project Support
Anthony Fernandez	Undergrad - B.S	Mechanical Eng.	Evaluation of Nonmetallic Components in the Waste Transfer System
John Conley	Undergrad - B.S.	Mechanical Eng	
Brian Castillo	Undergrad - B.S.	Biomedical Eng.	Development of a Micromachined Ultrasonic Transducer System for Analysis of HLW Pipes at Hanford
Gene Yllanes	Undergrad - B.S.	Electrical Eng.	Evaluation of FIU's SLIM for Estimating the Onset of Deep Sludge Gas Release Events
Iti Mehta	Undergrad - B.S.	Mechanical Eng.	Investigation Using an Infrared Temperature Sensor to Determine the Inside Wall Temperature of DSTs
Maximiliano Edrei	Graduate – M.S.	Mechanical Eng.	Computational Fluid Dynamics Modeling of HLW Processes in Waste Tanks
Ryan Sheffield	Undergrad - B.S.	Mechanical Eng.	Development of Inspection Tools for DST Primary Tanks
Sebastian Zanlongo	Graduate – Ph.D.	Computer Science	
Erim Gokce	Undergrad - B.S.	Mechanical Eng.	



Project 2 – DOE Fellows Support



DOE Fellow	Classification	Major	Project Support
Alejandro Garcia	Graduate - M.S.	Geoscience	Groundwater Remediation at PNNL
Alejandro Hernandez	Undergrad - B.S.	Chemistry	Groundwater Remediation at SRS F/H -Area
Christine Wipfli	Undergrad - B.S.	Envr. Eng.	
Awmna Kalsoom	Undergrad - B.S.	Chemistry	Surface Water Modeling of Tims Branch
Christopher Strand	Undergrad - B.S.	Civil & Env. Eng.	
Natalia Duque	Graduate – M.S.	Envr. Eng.	
Claudia Cardona	Graduate - Ph.D.	Envr. Eng.	Sequestering Uranium at the Hanford 200 Area Vadose Zone
Robert Lapierre	Graduate – M.S.	Chemistry	



Project 2 – DOE Fellows Support (con't)



DOE Fellow	Classification	Major	Project Support
Alexis Smoot	Undergrad - B.S.	Envr. Eng.	Synergistic Effects of Silica and Humic Acid on U(VI) Removal
Hansell Gonzalez	Graduate - Ph.D.	Chemistry	Sorption Properties of Humate Injected into the Subsurface System
Sarah Bird	Undergrad - B.S.	Envr. Eng.	Modeling of the Migration and Distribution of Natural Organic Matter injected into Subsurface Systems
Silvina Di Pierto	Graduate - Ph.D.	Chemistry	Evaluation of Ammonia for Uranium Treatment



Project 3 – DOE Fellows Support



DOE Fellow	Classification	Major	Project Support
Janesler Gonzalez	Undergrad - B.S.	Mechanical Eng.	Fire Resiliency Enhancement for Fixatives
Jesse Viera	Undergrad - B.S.	Mechanical Eng.	
Meilyn Planas	Undergrad - B.S.	Electrical Eng.	
Orlando Gomez	Graduate - Ph.D.	Physics	
Yoel Rotterman	Undergrad - B.S.	Mechanical Eng.	
Jorge Deshon	Undergrad - B.S.	Computer Eng.	Information Technology for EM



DOE-FIU Cooperative Agreement

DOE-FIU Cooperative Agreement



"Working together for a safer and cleaner environment."



Dr. Leonel E. Lagos, Principal Investigator

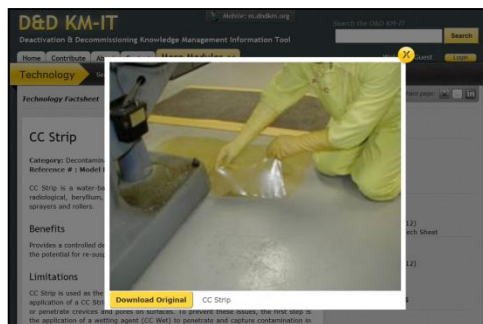




ARC Committed to Support and Advance the DOE EM Environmental Restoration Mission



- 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.
- Tuition waiver for graduate studies (Master, PhDs).
- 2 to 4 years Developmental Training Program (depends on masters or PhD track).
- DOE Lecture Series and technical seminars.
- Participation in conferences/workshops.



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 (fellows.fiu.edu)
- Open to undergraduate (juniors and seniors) and graduate students
- Under-represented minority students
- Must be available to participate in program activities (summer internships, conferences, weekly meetings)



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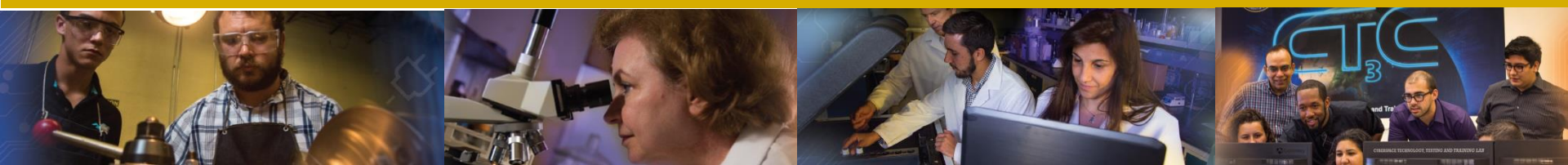
solution driven

DOE-FIU

Science & Technology Workforce Development Program

Accomplishments

FLORIDA INTERNATIONAL UNIVERSITY





Student Recruitment



- DOE Fellows recruiting other FIU students
- Information Sessions (Spring and Fall semesters)
- In-class presentations for selected STEM courses
- FIU Career and Engagement Office
- Presentations at student societies (ASME, SHEP, SBEP, SWE, etc.)
- DOE Fellows Selection Committee integrated by DOE-EM (HR and Technical), FIU College of Engr., FIU College of Arts & Sciences, and ARC staff



Information Session



Recruiting Fellows



DOE Fellows Hands-On Research at FIU





DOE Fellows Induction Ceremony



A total of **120 FIU minority STEM students** have been inducted as DOE Fellows.

Conducted a total of 9 Induction Ceremonies since program inception in 2007.





DOE Fellows Induction Events – Robotics Lab Tour





DOE Fellows at Conferences



WM Student Poster Session

Won **one (1)** Best Professional Poster and **five (5)** Best Student Posters at Waste Management Symposia since 2008.



Best Student Poster WM15

Presented over **165** papers and posters at Waste Management (2008-2016) and other national/international conferences, including two (**2**) presentations at ICEM13 (Brussels, Belgium), and **5** at ANS conferences.



Entering the Workforce Panel at WM15



DOE Fellows at WM16



DOE Fellow Silvina A. Di Pietro awarded 2016 Roy G. Post Foundation Scholarship





DOE Fellows WM16 Student Posters



- Nonmetallic Materials Testing for Hanford's HLW Transfer System - **Anthony Fernandez**
- Modifications/Enhancements to the Robotic Pipe Inspection Tool Utilized for the DOE High Level Waste Project at the Hanford Site - **Erim Gokce**
- Rapid Imaging of Solids in High Level Waste Tanks at Hanford - **Gene Yllanes**
- Stainless Steel Corrosion: Feed Properties Affecting Material Selection for LAWPS Piping at Hanford Site - **John Conley**
- Radial Jet Impingement Correlation Investigation - **Maximiliano Edrei**
- Development of a Miniature Motorized Inspection Tool for the Hanford DOE Site Tank Bottoms - **Ryan Sheffield**
- Cooperative Robotic Scheduling and Path Planning for D&D Applications - **Sebastian Zanlongo**



DOE Fellows WM16 Student Posters



- Kinetic and Mechanistic Studies of U(VI) Bearing Groundwater Treated with Sodium Silicate at the Savannah River Site - **Alejandro Hernandez**
- Application of Geospatial Tools to Support Development of a Hydrological Model of the Tims Branch Watershed, Aiken, SC - **Awmna Rana**
- A Study of Sodium Silicate Treatment for the U(VI) - Impacted Acidic Groundwater at Savannah River Site's F/H area – **Christine Wipfli**
- Topographic Analysis of Time Series Data to Support the Hydrology Model of the Tims Branch Watershed, Aiken, SC - **Christopher Strand**
- Study of an Unrefined Humate Solution as a Possible Remediation for Groundwater Contamination at SRS - **Hansell Gonzalez Raymat**
- A Model to Simulate Flow in Tims ranch, Savannah River Site, SC - **Natalia Duque**
- The Characterization of Uranium Phases Produced by the NH₃ Injection Remediation Method under Hanford 200 Area Conditions - **Robert Lapierre**
- Ammonia Gas Injection for Remediation of Uranium Contamination - **Silvina Di Pietro**
- Green & Sustainable Remediation Analysis of a Packed Tower Air Stripper Used to Remediate Groundwater Contaminated with CVOCs - **Yoel Rotterman**



DOE Fellows WM16 Student Posters



- Innovative Process for Abatement of Mercury - **Janesler Gonzalez**
- The Expanding Nuclear Niche and Growing Requirements for Standardized Testing Protocols and Performance Metrics for D&D Tech. - **Jesse Viera**
- Fixatives Decision Model on KM-IT Platform - **Jorge Deshon**
- Heat Transfer Calculations for the Use of an Infrared Temperature Sensor - **Meilyn Planas**



DOE Fellows - WM16 Professional Posters/Presentations



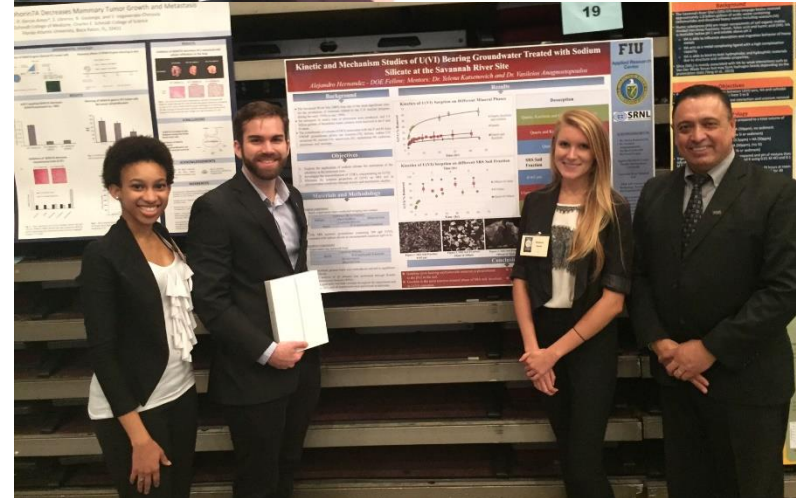
- Yoel Rotterman presented a professional poster on “*DOE Climate Change Vulnerability and Adaption Planning*” during Session 71 (Environmental Remediation Topic - A Posters: Environmental Remediation Analysis, Technology and Treatment Systems).
- Robert Lapierre presented during professional session 81, on “*Characterization of U(VI)-Bearing Precipitates Produced by Ammonia Gas Injection Technology for Unsaturated Sediments*”
- Ryan Sheffield presented during professional session 95 on “*Development of Inspection Tools for the AY-102 Double-shell Tank at the Hanford DOE Site*”
- Christine Wipfli participated as a panelist in Session 42, “*Graduating Scientists and Engineers: Wants and Needs Does it Differ Between Countries?*” and as a panel reporter in Session 19 “*US DOE EM Risk-Informed performance Based Decision Making*”.



DOE Fellows - LSSF

FIU
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Center

- Life Sciences South Florida STEM Undergraduate Research Symposium
- 2015: 4 DOE Fellows participated
 - Christine Wipfli (DOE Fellow - Class of 2014) obtained 3rd place for her poster “*Sodium Silicate Treatment for Uranium (VI) Removal and pH Stabilization of the Groundwater Systems at the F/H Area of Savannah River Site.*”
- 2016: 3 DOE Fellows Participated
 - Alejandro Hernandez (DOE Fellow - Class of 2015) won 1st place for his poster “*Kinetic and Mechanism Studies of U(VI) Bearing Groundwater Treated with Sodium Silicate at the Savannah River Site.*”





DOE Fellow Internships



95 internships completed at DOE sites, DOE national labs, DOE-HQ, and DOE contractors across the DOE Complex



DOE Fellow Internships



- 21 DOE EM HQ
- 21 ORNL / Y-12 NSC
- 14 SRS/SRNL
- 12 Hanford/WRPS
- 11 PNNL
- 4 INL
- 2 DOE Oak Ridge
- 2 Columbia Energy & Envr
- 2 NuVision Engr.
- 2 Sullivan International
- 1 LLNL
- 1 Moab
- 1 NETL
- 1 ORP





Summer 2015 Internships



Project	DOE Fellow	DOE Site	Summer Mentor(s)
1	Anthony Fernandez	WRPS	Ruben Mendoza and Gregory Gauck
	Maximiliano Edrei	NETL	Chris Guenther
	Ryan Sheffield	DOE-HQ EM-20	James Poppiti
	John Conley	WRPS	Terry Sams and Dave Shuford
2	Aref Shehadeh	SRNL	Miles Denham
	Christine Wipfli	DOE-HQ EM-12	Skip Chamberlain/Kurt Gerdes
	Kiara Pazan	SRNL	Miles Denham and Margaret Millings
	Claudia Cardona	PNNL	Jim Sczcsody
3	Natalia Duque	SRNL	Ralph Nichols
	Yoel Rotterman	DOE-HQ EM-13	Albes Ganoa/John De Gregory
4	Andrew De La Rosa	ORNL	Joseph Trien
	Janesler Gonzalez	INL	Rick Demmer/Steve Reese
	Jesse Viera	INL	Rick Demmer/Steve Reese
	Jorge Deshon	SRNL	John Bobbitt and Steven Tibrea
	Meilyn Planas	WRPS	Terry Sams



Spring/Summer 2016 Internships



Project	DOE Fellow	Location	Internship Mentor	Comments
1	Erim Gokce	WRPS	Ruben/Dennis	High Level Waste
	Gene Yllanes	PNNL	Bill Glass	Robotics at PNNL
	Max Edrei	NETL	Chris Gunter	High Level Waste CFD
	Sebastian Zanlongo	LANL	David Mascarena	LANL robotics group
2	Alejandro Garcia	PNNL	Brady Lee	Spring: Task 2 and Masters
	Alejandro Hernandez	SRNL	Miles Denham	
	Alexis Smooth	DOE HQ	International Programs/Rosa Elmetti	
	Awmna Rana	REU/SREL	John Seaman (SREL)	Applied for MSIPP Internship, Alternative would be SRNL
	Christopher Strand	LANL	TBD	LANL Soil & Groundwater
	Hansel Gonzalez	SRNL	Miles Denham	Task 2 and PhD
	Sarah Bird	HQ /EM-12	Skip Chamberlain (EM-12)	SRNL Soil & Groundwater
	Silvina Di Pietro	PNNL	Jim Szecosdy/Nik Qafoku	Task 2 and PhD
3	Orlando Gomez	INL	David Chichester	Radiation Detection for D&D



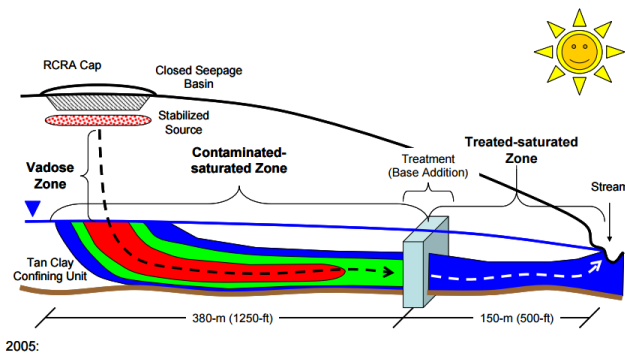
DOE Fellow Internship – HQ

Christine Wipfli

Summer 2015

DOE EM-12 at HQ

Skip Chamberlain/Kurt Gerdes



Assisted in the development of three case studies for inclusion in the ITRC Remediation Management of Complex Sites Case Studies on the remediation strategies utilized across complex sites throughout the U.S. including the innovative tools and technologies being applied to sites that face unique remediation challenges.

Technical Report: Development of Case Study Examples for ITRC Remediation of Complex Sites Subgroup



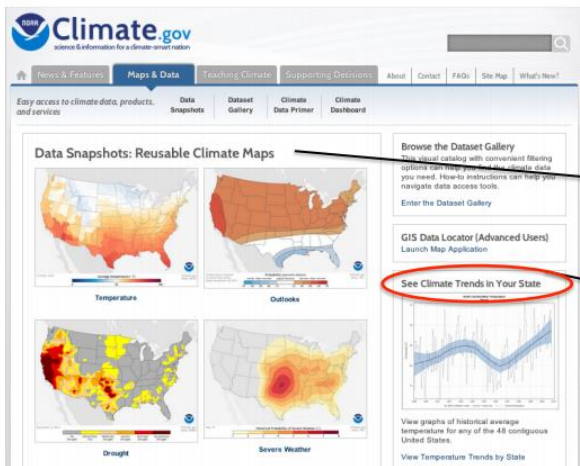
DOE Fellow Internship – HQ

Yoel Rotterman

Summer 2015

DOE EM-13 at HQ

Albes Ganoa/John De Gregory



Performed research on a climate change vulnerability assessment for several DOE sites as well as sustainability and technology applications for surveillance and maintenance.

Technical Report: Climate Change Vulnerability Assessment and Adaptation Plan for DOE Sites



DOE Fellow Internship - HLW



Maximiliano Edrei

Summer 2015

NETL

Chris Guenther



Performed computational fluid dynamics (CFD) simulations to provide insight on the applicability of current radial wall jet correlations used in the analysis of pulse jet mixing of high level waste prior to transfer/treatment.

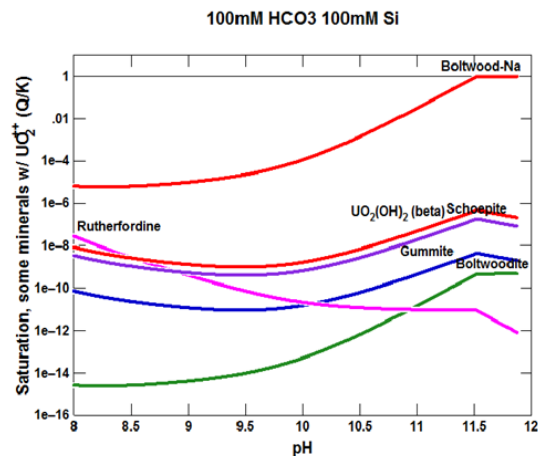
Technical Report: Radial Jet Impingement Correlation Investigation



DOE Fellow Internship – Soil/GW



Claudia Cardona
 Summer 2015
 PNNL
 Jim Szecsody



Performed ammonia gas experiments focusing on the sequestration of uranium in the vadose zone sediments at the Hanford Site 200 Area and used geochemical modeling software for speciation modeling of the major uranium species created after injection of the NH₃ gas.

Technical Report: Geochemistry Related to NH₃ Gas Used for Uranium Remediation in the Vadose Zone



DOE Fellow Internship – D&D

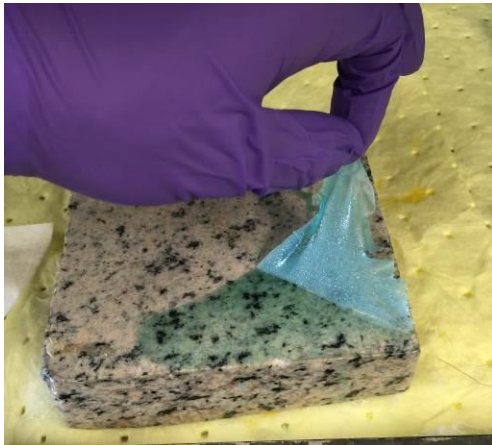


Janesler Gonzalez

Summer 2015

Idaho National Lab

Steve Reese/Rick Demmer



Performed experiments with four commercially available strippable coatings by diluting with water or ethanol and adding adsorption additives to optimize product consistency for application and studied the effects of the coating under different environmental conditions.

Technical Report: Mercury Abatement via Strippable Coating Technologies



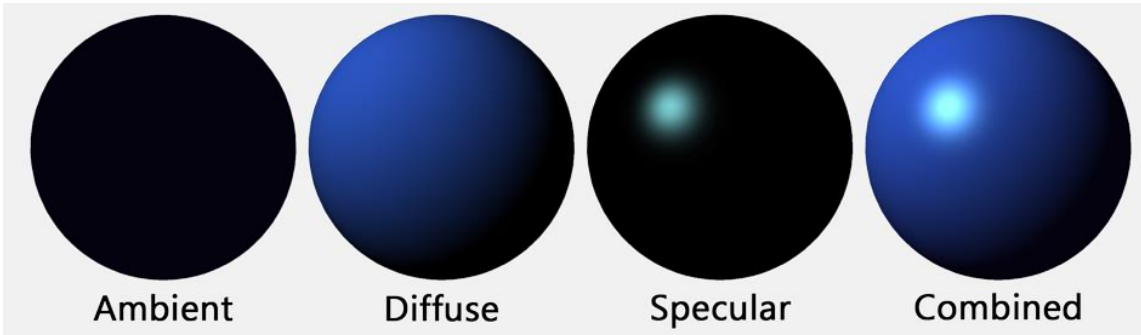
DOE Fellow Internship – IT

Jorge Deshon

Summer 2015

SRNL

John Bobbitt/Steven Tibrea



Performed research towards developing a catalogue of textures and their reflectivity properties for a visualization model of SRS Building 235-F.

Technical Report: 3D Visualization



IAEA Internship



Christine Wipfli

March 2016 – March 2017
IAEA Division of Nuclear Fuel
Cycle & Waste Technology
Vienna, Austria



DOE Fellow Christine Wipfli awarded a prestigious one-year internship at the International Atomic Energy Agency (IAEA) in the Division of Nuclear Fuel Cycle & Waste Technology in Vienna.



Annual DOE Fellows Poster Exhibition



9 DOE Fellow Poster Exhibitions held at FIU since 2007. 138 research posters presented.



Graduate Degrees Based on DOE EM Research



DOE-EM based research on the Cooperative Agreement projects are the basis of master's degree thesis and PhD dissertations completed or currently in progress (DOE Fellows & graduate research assistants).

45 Fellows started program as undergraduates and continued to obtain a Masters and/or PhD degree at FIU or other institutions (including MIT, Michigan, Purdue, Stanford, Virginia Tech, and others)





FIU Student Chapter American Nuclear Society



Officially launched on January 28, 2016 with a visit to FIU from ANS president Eugene “Gene” Grecheck for a special ceremony to present the Student Section Charter.



Chapter officers: Ryan Sheffield (President), Maximiliano Edrei (Vice President), Awmna Rana (Secretary), Janesler Gonzalez (Committee Head), and Jesse Viera (Treasurer). Dr. Leonel Lagos from FIU’s Applied Research Center is serving as the FIU Chapter Faculty Advisor.



DOE Fellows Lecture Series



- Lee Brady (PNNL)
- Steve Thompson (UK's NNL)
- Anthony Banford (UK's NNL)
- Keith Miller (UK's NNL)
- Don Reed (LANL)
- Karthik Subramanian (WRPS)
- Jim Voss (WM Symposium)
- Costas Tsouris (ORNL)





STEM Outreach – 2016 Engineering Gala





Getting Them Hired



- **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.).
- **58** Fellows hired by private STEM industry (GE, Lockheed Martin, Raytheon, Texas Instruments, Motorola, Florida Power & Light, Boeing, Inter Corporation, MWH Global Inc., and others) .
- Graduation rate of DOE Fellows - 99%
- Retention rate of DOE Fellows in the program - 75%



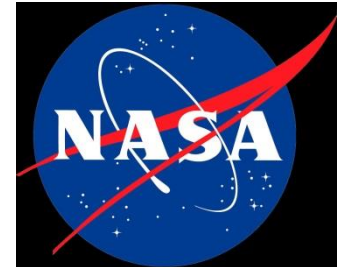
STEM Minority Students Pipeline

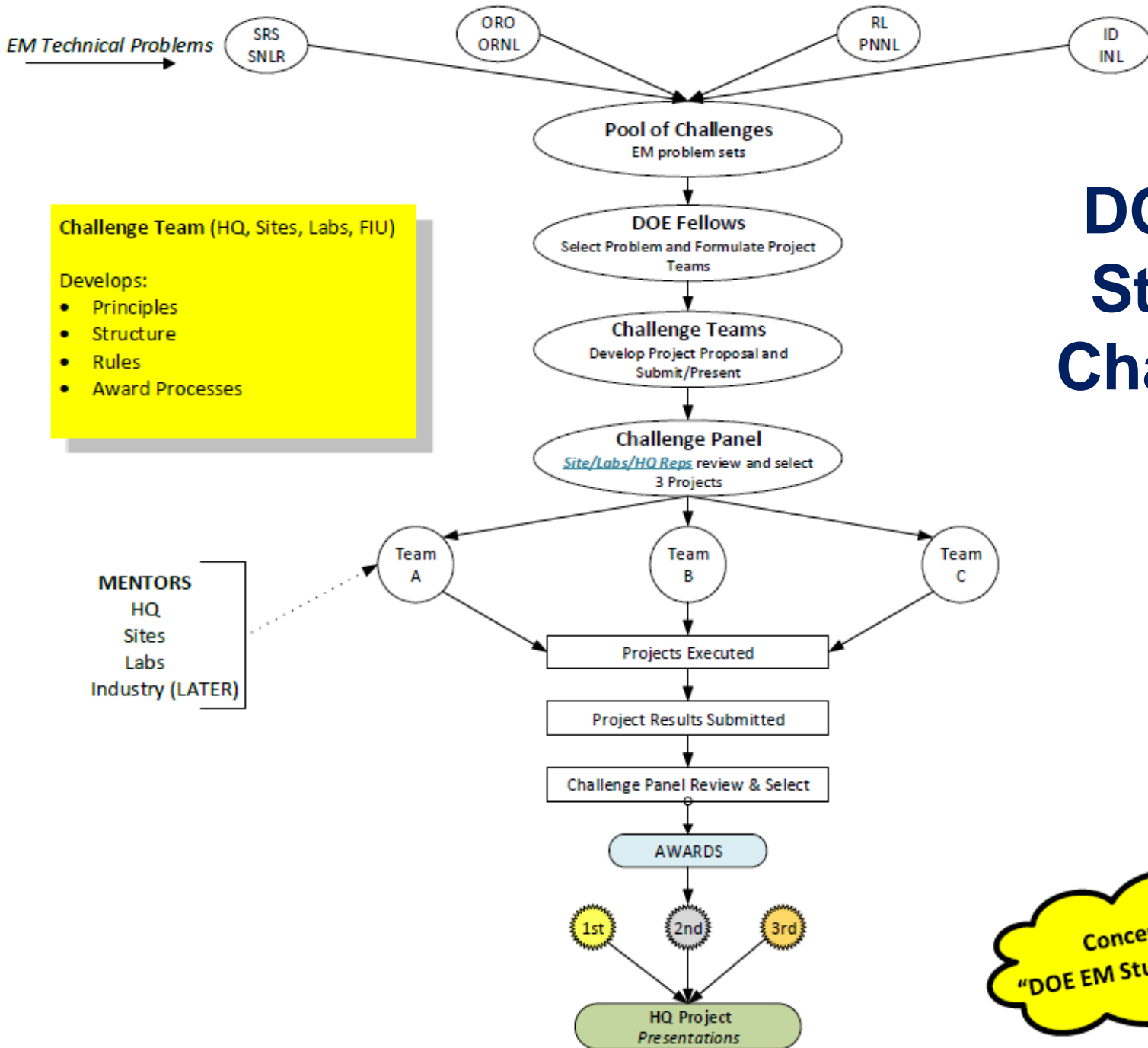


MOTOROLA



THE TEXAS SOLUTION





Challenge Team (HQ, Sites, Labs, FIU)

Develops:

- Principles
- Structure
- Rules
- Award Processes

DOE EM Student Challenge

(draft)

Concept for the "DOE EM Student Challenge"



DOE Fellows Having Fun & Helping the Community



Everglades National Park



Ropes Course, Biscayne Bay



Beach Cleanup, Key Biscayne



White Salmon, Washington



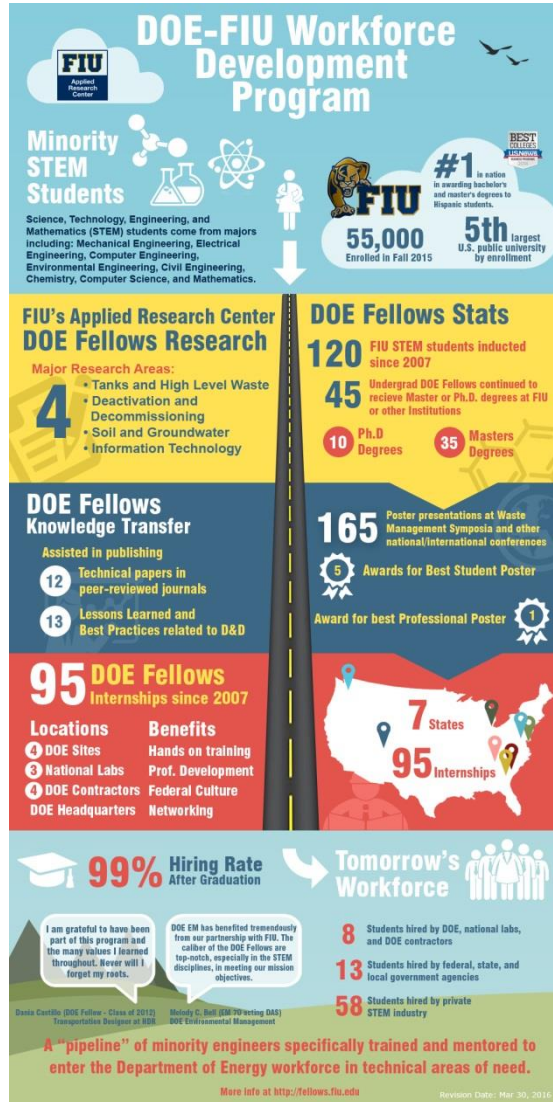
Chemis-Tree



Christmas Party 2015



DOE Fellows – The Big Picture



Click on image to open infographic



Program Website and Facebook



<http://fellows.fiu.edu>

Follow us on Facebook at:

[FIU Science and Technology Workforce Development Initiative](#)

DOE Fellows
 IE Fellows at Florida International University

News & Events

DOE/FIU Science & Technology Workforce Development Initiative

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- Message from the Program Director
 - Program Description
 - Program Brochure
 - Program Fact Sheet
 - The Big Picture
 - Apply to the Program
 - Internship Reports

Become a **DOE Fellow** and make a difference

Fall 2015 Enrollment September 1-25, 2015

Fall 2015 Recruitment

DOE-FIU Science & Technology Workforce Development Program accepts applications three times per year at the beginning of each semester. If you are interested, please download the application form and mail, [...]

Message from the Program Director

I wanted to let you know about an incredible opportunity made possible to FIU minority students thanks to the sponsorship and funding of the Department of Energy's Office of Environmental Management (DOE-EM). In an effort to overcome the challenges of an aging workforce DOE-EM is actively and aggressively targeting college students across the US to enter DOE's workforce.

[Continue Reading](#)

The DOE Fellows Experience Video

DOE Fellows 2015

Testimonial

I am grateful to have been part of this program and the many values I learned throughout. Never will I forget my roots. You do an amazing job Dr. Leonel Lago!!!

Dania Castillo, (DOE Fellow - Class of 2012) now a Transportation Designer at H

book Sign Up

Email or Phone Password

Keep me logged in Forgot your password

FIU Science and Technology Workforce Development Initiative is on Facebook.

To connect with FIU Science and Technology Workforce Development Initiative, sign up for Facebook today.

Sign Up Log In

FIU Science and Technology Workforce Development Organization

Timeline About Photos Reviews More

188 likes 3 visits

FIU Science and Technology Workforce Development Initiative August 5

The Iceberg Illusion - GANAS IIIII

Like Comment Share

Silvina A. Di Pietro likes this.



DOE Fellows Video



The DOE Fellows Experience Video