

José Manuel Cerrato

The University of New Mexico
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Albuquerque, NM 87106
USA

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EDUCATION

Washington University in St. Louis Postdoctoral Research Associate Department of Energy, Environmental and Chemical Engineering	Saint Louis, Missouri 2010 – 2013
Virginia Polytechnic Institute and State University (Virginia Tech) Doctorate of Philosophy, Civil Engineering <i>Dissertation: Biogeochemical Cycling of Manganese in Drinking Water Systems</i>	Blacksburg, Virginia 2005 - 2010
Virginia Polytechnic Institute and State University (Virginia Tech) Master of Science in Environmental Engineering <i>Thesis: Impact of Piping Materials on Water Quality in Tegucigalpa, Honduras</i>	Blacksburg, Virginia 2003 - 2005
Universidad Nacional Autónoma de Honduras (UNAH) Bachelor of Science in Civil Engineering	Tegucigalpa, Honduras 1996 – 2001

APPOINTMENTS

The University of New Mexico Assistant Professor Department of Civil Engineering	Albuquerque, New Mexico 2013 – Present
Washington University in St. Louis Postdoctoral Research Associate Department of Energy, Environmental and Chemical Engineering	Saint Louis, Missouri 2010 – 2013
Virginia Polytechnic Institute and State University (Virginia Tech) Graduate Research Assistant Department of Civil and Environmental Engineering	Blacksburg, Virginia 2004 - 2010

AWARDS AND HONORS

- National Science Foundation (NSF) CAREER Award, 2017-2022.
- University of New Mexico Faculty of Color Research Award, 2016.
- Oak Ridge Associated University (ORAU) Program Ralph E. Powe Junior Faculty Enhancement Award, 2015-2016.
- American Society of Civil Engineers (ASCE) ExCEEEd Teaching Fellowship, 2015.
- Selected as Oral Presenter and Recipient of an Early Career Travel Award for Synchrotron Environmental Science VI, Argonne National Laboratory, September 11-12, 2014.
- Selected as a Poster Presenter for the Paul E. Torgersen Graduate Student Research Excellence Award, College of Engineering, Virginia Tech, 2010.
- NSF, Exploring Interfaces through Graduate Education and Research (EIGER) – Integrative Graduate Education and Research Traineeship (IGERT) Program, Associate Fellow, 2007 - 2010.

- Best Student Poster Presentation - Third Place Award in the Natural and Earth Sciences Category, Virginia Tech Graduate Student Assembly (GSA) Research Symposium, 2007.
- Best Student Paper Presentation, Virginia Water, Science and Technology Symposium, 2006.
- Edna Bailey Sussman Fellowship, 2006.
- Waste Policy Institute Fellowship, 2006.
- Fulbright - Organization of American States (OAS), Full Masters Degree Scholarship, 2003 - 2005.
- Universidad Nacional Autónoma de Honduras (UNAH), Diploma of Academic Excellence, 2000 - 2001.

REFEREED JOURNAL PUBLICATIONS

- Blake, Johanna, DeVore, Cherie, Avasarala, Sumant, Ali, Abdul-Mehdi, Roldan, Claudia, Bowers, Fenton, Spilde, Michael, Artyushkova, Kateryna, Kirk, Matthew F., Peterson, Eric, Rodríguez-Freire, Lucia, and Cerrato, José M., (2017). Uranium mobility and accumulation along the Rio Paguete, Jackpile Mine in Laguna Pueblo, New Mexico. *Environmental Science: Processes & Impacts*, DOI: 10.1039/C6EM00612D.
- Saup, Casey, Williams, Kenneth, Rodríguez-Freire, Lucia, Cerrato, José M., Johnston, Michael D., and Wilkins, Michael J. (2017). Anoxia stimulates microbially catalyzed metal release from Animas River sediments. *Environmental Science: Processes & Impacts*, DOI: 10.1039/C7EM00036G.
- Rodríguez-Freire, Lucia, Avasarala, Sumant, Ali, Abdul-Mehdi S., Agnew, Diane, Hoover, Joseph, Artyushkova, Kateryna, Latta, Drew, Peterson, Eric, Lewis, Johnnye, Brearley, Adrian J., and Cerrato, José M., (2016) Post Gold King Mine spill investigation of metal stability in water and sediments of the Animas River watershed. *Environmental Science and Technology*, 50, 11539–11548.
- Ruiz, Omar, Thomson, Bruce, and Cerrato, José M., (2016) Investigation of in-situ leach (ISL) mining of uranium in New Mexico and post-mining reclamation. *New Mexico Geology*, 38, 77-89.
- Shaikh, Nabil, Taujale, Saru, Zhang, Huichun, Artyushkova, Kateryna, Ali, Abdul-Mehdi S., and Cerrato, José M., (2016) Spectroscopic investigation of interfacial interaction of manganese oxide with Triclosan aniline, and phenol. *Environmental Science and Technology*, 50,10978-10987.
- Asadi, M., Kim, K., Liu, C., Addepalli, A.V., Abbasi, P., Yasaei, P., Phillips, P., Behranginia, A., Cerrato J.M., Haasch, R., Zapol, P., Kumar, B., Klie, R.F., Abiade, J., Curtiss, L.A., Salehi-Kojin, A., (2016). Nanostructured transition metal dichalcogenide electrocatalysts for CO₂ reduction in ionic liquid. *Science*, 353 (6298), 467-470.
- Cerrato, José M., Blake, Johanna M., Hirani, Chris, Clark, Alexander L., Ali, Abdul-Mehdi S., Artyushkova, Kateryna, Peterson, Eric, and Bixby, Rebecca (2016). Wildfires and Water Chemistry: Effect of Metals Associated with Wood Ash. *Environmental Science: Processes & Impacts*, 18, 1078-1089.
- Blake, Johanna M., Avasarala, Sumant, Artyushkova, Kateryna, Ali, Abdul-Mehdi S., Brearly, Adrian J., Shuey, Christopher, Robinson, Wm. Paul, Nez, Christopher, Bill, Sadie, Lewis, Johnnye, Hirani, Chris, Lezama-Pacheco, Juan S., and Cerrato, José M., (2015) Elevated concentrations of U and co-occurring metals in abandoned mine wastes in a Northeastern Arizona Native American community. *Environmental Science and Technology*, 49, 8506-8514.
- Lezama-Pacheco, Juan S., Cerrato, José M., Alessi, Daniel S., Veeramani, H., Suvorova, Elena I., Bernier-Latmani, Rizlan, Giammar, Daniel E., Long, Phillip, E., Williams, Kenneth H., and Bargar, John R., (2015) Long-term in-situ oxidation of biogenic uraninite in an alluvial aquifer: impact of dissolved oxygen and calcium, *Environmental Science and Technology*, 49, 7340-7347.
- Alessi, Daniel S., Lezama-Pacheco, Juan S., Janot, Noémie, Suvorova, Elena I., Cerrato, José M.,

- Giammar, Daniel E., Davis, James A., Fox, Patricia M., Williams, Kenneth H., Long, Phillip E., Handley, Kim M., Bernier-Latmani, Rizlan, and Bargar, John R. (2014) Speciation and reactivity of uranium products formed during *in situ* bioremediation in an alluvial aquifer, *Environmental Science and Technology*, 48, 12842-12850.
- Massey, Michael S., Lezama-Pacheco, Juan S., Jones, Morris E., Ilton, Eugene S., Cerrato, José M., Bargar, John R., and Fendorf, Scott, (2014) Competing retention pathways of uranium upon reaction with Fe(II), *Geochimica et Cosmochimica Acta*, 142, 166 - 185.
- Cerrato, José M., Ashner, Matthew N., Alessi, Daniel S., Bernier-Latmani, Rizlan, Lezama-Pacheco, Juan S., Bargar, John R., and Giammar, Daniel E., (2013) Relative Reactivity of Biogenic and Chemogenic Uraninite and Biogenic Non-crystalline U(IV), *Environmental Science and Technology*, 47, 9756 - 9763.
- Giammar, Daniel E., Cerrato, José M., Mehta, Vrajesh, Wang, Zimeng, Wang, Yin, Pepping, Troy J., Ulrich, Kai-Uwe, Lezama-Pacheco, Juan S., and Bargar, John R., (2012) Effect of diffusive transport limitations on UO₂ dissolution, *Water Research*, 46, 6023 - 6032.
- Cerrato, José M., Barrows, Charles J., Blue, Lisa Y., Lezama-Pacheco, Juan S., Bargar, John R., and Giammar, Daniel E., (2012) Effect of Ca²⁺ and Zn²⁺ on UO₂ dissolution rates, *Environmental Science and Technology*, 46, 2731 - 2737.
- Cerrato, José M., Knocke, William R., Hochella, Jr., Michael F., Dietrich, Andrea M., Jones, Andrew, and Cromer, Thomas F., (2011) Application of XPS and solution chemistry analyses to investigate soluble manganese removal by MnO_x(s)-coated media, *Environmental Science and Technology*, 45, 10068 - 10074.
- Cerrato, José M., Hochella, Jr., Michael F., Knocke, William R., Dietrich, Andrea M., and Cromer, Thomas F., (2010) Use of XPS to identify the oxidation state of Mn in solid surfaces of filtration media oxide samples from drinking water treatment plants. *Environmental Science and Technology*, 44, 5881 - 5886.
- Cerrato, José M., Falkinham III, Joseph O., Dietrich, Andrea M., Knocke, William R., McKinney, Chad W., and Pruden, Amy. (2010) Manganese-oxidizing and -reducing microorganisms isolated from biofilms in chlorinated drinking water systems. *Water Research*, 44, 3935 - 3945.
- Cerrato, José M., Reyes, Lourdes P., Alvarado, Carmen N., and Dietrich, Andrea M. (2006) Effect of PVC and iron materials in drinking water distribution systems on Mn(II) deposition. *Water Research*, 40 2720 - 2726.

PRESENTATIONS

Selected Oral Presentations

- Invited: Cerrato, José M., Metal Mixtures in Abandoned Uranium Mine Wastes of the Southwestern US, Department of Earth and Environmental Science, New Mexico Tech, Socorro, 2016.
- Cerrato José M., Blake, Johanna M., Hirani, Chris, Clark, Alexander, Ali, Abdel-Mehdi S., Artyushkova, Kateryna, Peterson, Eric, and Bixby, Rebecca, Reactivity of Metals from Wildfire Ash, 251st National Conference and Exposition of the American Chemical Society, San Diego, CA, 2016.
- Invited: Cerrato, José M., Metal Occurrence in Abandoned Uranium Mine Wastes. Society of Hispanic Professional Engineers (SHPE), Baltimore, MD, 2015.
- Invited: Cerrato, José M., Aplicación de Microscopía y Espectroscopia Avanzada para la Investigación de Procesos Biogeoquímicos de Metales que Afectan la Calidad del Agua, Congreso de la Conferderación Panoamericana de Ingeniería Mecánica, Eléctrica, Industrial y Ramas Afines (COPIMERA) 2016, Tegucigalpa, Honduras.
- Invited: Cerrato, José M., Avasarala, Sumant, Blake, Johanna, Ali, Abdul-Mehdi, Brearly, Adrian, Aryushkove, Kateryna, Lezama-Pacheco, Juan S., Metal Reactivity in Abandoned Uranium Mine Wastes. 250th National Conference and Exposition of the American Chemical Society, Boston, MA, 2015.

Invited: Cerrato, José M., Avasarala, Sumant, Blake, Johanna, Ali, Abdul-Mehdi, Brearly, Adrian, Aryushkove, Kateryna, Lezama-Pacheco, Juan S., Interactions of Uranium and Co-occurring Elements in Abandoned Mine Wastes. 250th National Conference and Exposition of the American Chemical Society, Boston, MA, 2015.

Invited: Cerrato, José M. Reactivity of Metals in Abandoned Uranium Mine Wastes, Department of Earth and Planetary Sciences, UNM, Albuquerque, NM, 2015.

Invited: Cerrato, José M. Spectroscopy and Microscopy Study of Abandoned Uranium Mine Wastes in Northeastern Arizona, Stanford Synchrotron Radiation Lightsource (SSRL) Annual User Meeting, Menlo Park, CA, 2014.

Invited: Cerrato, José M. Integrated Spectroscopy, Microscopy, and Aqueous Chemistry Investigation of Heavy Metals in Abandoned Mine Wastes in the Southwest, Argonne National Laboratory, IL, 2014.

Invited: Cerrato, José M. Reactivity of Metals in Abandoned Uranium Mine Wastes, Department of Earth and Planetary Sciences, UNM, Albuquerque, NM, 2015.

Invited: Cerrato, José M. Spectroscopy and Microscopy Study of Abandoned Uranium Mine Wastes in Northeastern Arizona, Stanford Synchrotron Radiation Lightsource (SSRL) Annual User Meeting, Menlo Park, CA, 2014.

Invited: Cerrato, José M. Integrated Spectroscopy, Microscopy, and Aqueous Chemistry Investigation of Heavy Metals in Abandoned Mine Wastes in the Southwest, Argonne National Laboratory, IL, 2014.

Cerrato, José M., Lezama-Pacheco, Juan S., Williams, Kenneth H., Long, Phillip, Alessi, Daniel S., Suvorova, Elena I., Bernier-Latmani, Rizlan, Giammar, Daniel E., and Bargar, John. Effect of Groundwater Solutes on Uraninite Stability: Laboratory and Field Studies, Goldschmidt, Sacramento, CA, 2014.

Cerrato, José M., Bargar, John, Janot, Noémie, Alessi, Daniel S., Jones, Morris, Williams, Kenneth H., Long, Phillip, and Bernier-Latmani, Rizlan. Bioremediation to Plume Persistence: Uranium Biogeochemistry in Naturally and Artificially Bioreduced Aquifer Sediments, Goldschmidt, Sacramento, CA, 2014.

Invited: Cerrato, José M., Stability and Reactivity of U(IV) in Groundwater Remediation, University of Houston, TX, 2014.

Cerrato, José M., Ashner, Matthew N., Alessi, Daniel S., Bernier-Latmani, Rizlan, Lezama-Pacheco, Juan S., Bargar, John R., and Giammar, Daniel E., Use of chemical extractions to evaluate the reactivity of U(IV) species. 245th National Conference and Exposition of the American Chemical Society, New Orleans, LA, 2013.

Selected Poster Presentations

Cerrato, José M., Blake, Johanna, Hirani, Chris, Clark, Alexander, Ali, Abdul-Mehdi S., Artyushkova, Kateryna, Peterson, Eric, and Bixby, Rebecca, Effects of Wildfire Ash on Water Quality. Gordon Research Conference - Environmental Sciences: Water, Holderness, New Hampshire, 2016.

Ali, Abdul-Mehdi S., Avasarala, Sumant, Cerrato, José M., and Blake, Johanna M. Chemical and mineralogical characterization of abandoned mine waste in northeastern Arizona. Geochemical Society of America Annual Meeting, Vancouver BC, Canada, 2014.

Cerrato, José M., Giammar, Daniel E., Lezama-Pacheco, Juan S., Bargar, John R., Alessi, Daniel S., Bernier-Latmani, Rizlan, Long, Phillip E., Williams, Kenneth H., Avasarala, Sumant, Ali, Abdul-Mehdi S., Artyushkova, Kateryna, Brearly Adrian, Shuey, Christopher, Robinson, Paul, and Bill Sadie, Reactivity U in Surface/Subsurface Environments: Insights from Laboratory and Field Experiments. Gordon Research Conference - Environmental Sciences: Water, Holderness, New Hampshire, 2014.

Cerrato, José M., Giammar, Daniel E., Ashner, Matthew N., Wang, Zimeng, Wang, Yin, Mehta, Vrajesh, Lezama-Pacheco, Juan S., Bargar, John R., Alessi, Daniel S., Bernier-Latmani, Rizlan, Long, Phillip

E., and Williams, Kenneth H., Stability of U(IV) Products of Uranium Bioremediation in Groundwater. Gordon Research Conference - Environmental Sciences: Water, Holderness, New Hampshire, 2012.

Giammar, Daniel E., Cerrato, José M., Ashner, Matthew N., Wang, Zimeng, Mehta, Vrajesh, Lezama-Pacheco, Juan S., Bargar, John R., Alessi, Daniel S., Bernier-Latmani, Rizlan, Long, Phillip E., and Williams, Kenneth H., Biogeochemical Processes and Diffusive Transport Limitations Affecting the Stability of Biogenic U(IV). Subsurface Biogeochemistry Meeting of the U.S. Department of Energy, Washington, D.C., 2012.

Cerrato, José M., Giammar, Daniel E., Barrows, Charles, Lezama-Pacheco, Juan S., and Bargar, John R., Effect of cations on uranium mobilization from uraninite in groundwater. Conference of the Association of Environmental Engineering and Science Professors, Tampa, FL, 2011.

Giammar, Daniel E., Cerrato, José M., Barrows, Charles, Wang, Zimeng, Mehta, Vrajesh, Stubbs, Joanne E., Lezama-Pacheco, Juan S., Bargar, John R., Veeramani, Harish, Bernier-Latmani, Rizlan, Eng, Peter J., Campbell, Kate M., and Yabusaki, Steven B., Subsurface Biogeochemistry of Nano-uraninite. Surface Biogeochemistry Meeting of the U.S. Department of Energy, Washington, D.C., 2011.

RESEARCH EXPERIENCE

The University of New Mexico

Department of Civil Engineering

Assistant Professor

Albuquerque, New Mexico

07/13 – Present

Principal Investigator of the E-H₂O Research Group.

Pursuing interdisciplinary research of biogeochemical processes occurring at the interface of water and energy that affect the cycle of metals and radionuclides in the environment.

Collaborating with researchers from Stanford University, Temple University, University of Alberta, University of Illinois-Chicago, Tufts University, and Sandia National Laboratories.

Washington University in Saint Louis

*Department of Energy, Environmental,
and Chemical Engineering*

Postdoctoral Research Associate

Saint Louis, Missouri

06/10 – 07/13

Studied the biogeochemical processes influencing the stability of different uranium(IV) species in groundwater and subsurface environments.

Collaborated with the Science Focus Area (SFA) interdisciplinary research group sponsored by the U.S. Department of Energy (DOE) comprised of researchers from Stanford University, Oregon Health and Science University (OHSU), École Polytechnique Fédérale de Lausanne (EPFL in Switzerland), and Washington University in St. Louis.

Assisted with laboratory management and coordination of a research group composed of graduate and undergraduate students.

Participated in extracurricular STEM faculty workshops organized by *The Teaching Center* focused on Mentoring, Problem-Based Learning, and other Active Learning Strategies.

Virginia Tech

*Department of Civil and
Environmental Engineering*

Graduate Research Assistant

Blacksburg, Virginia

01/04 – 05/10

Participated as an Associate Fellow in the core courses and extracurricular activities of the EIGER-IGERT support and training program for interdisciplinary research funded by the US National Science Foundation (NSF).

Participated in curricular and extracurricular activities of the Graduate Education Development Institute (GEDI) focused on teaching and learning issues in partnership with the Graduate School at Virginia Tech.

Studied the mechanism and effect of manganese removal and deposition in drinking water systems through interdisciplinary research in microbiology, surface science, applied physics, chemistry, and engineering.

Analyzed the impact of PVC and iron pipes on water quality within the context of the urban distribution system of Tegucigalpa, Honduras. Measured different water quality parameters and analyzed the data obtained using SAS and R statistical software.

Sampled in different locations of the distribution system of the reservoir "La Concepción", Tegucigalpa, Honduras with the collaboration of the National Autonomous Service of Aqueducts and Sewages of Honduras (SANAA) and the Pan-American Health Organization (PAHO).

Member of the interdisciplinary "NSF-Material Use: Science, Engineering, and Society (MUSES)" team for sustainable drinking water infrastructure.

TEACHING EXPERIENCE

The University of New Mexico

Environmental Eng. Chemistry

Class Instructor responsible of 15 students.

Albuquerque, New Mexico

Fall 2014, 2016

The University of New Mexico

Environmental and Water Resources Eng.

Class Instructor responsible of 37 students.

Albuquerque, New Mexico

Spring 2014, 2015

The University of New Mexico

Statics

Class Instructor responsible of 44 students.

Albuquerque, New Mexico

Fall 2013, Spring 2016

Virginia Tech

Environmental Chemistry

Invited Lecturer

Lectured three classes covering the topics "precipitation, complexation, and redox" chemistry. Organized and directed lectures; applied active learning techniques for in-class problem solving.

Blacksburg, Virginia

Fall Semester 2009

Virginia Tech

Techniques for Environmental and Analysis

Invited Lecturer

Lectured three classes covering the topics "applied statistical methods" and "environmental sampling". Organized and directed lectures; applied active learning techniques for in-class problem solving.

Blacksburg, Virginia

Semesters: Fall 2009 and Spring 2006

Virginia Tech

Environmental and Water Resources Graduate Seminar Teaching Assistant

Assisted in coordinating logistics and guest speakers for weekly seminar sessions. Organized and directed graduate students enrolled in seminar.

Blacksburg, Virginia

Fall Semester 2005

Universidad Nacional Autónoma de Honduras

Tegucigalpa, Honduras

Spring Semester 1999

Mathematics Teaching Assistant

Taught basic Mathematics 112 course: proctored and corrected tests, projects, and assignments and worked directly with the professor to review and organize class materials.

TEACHING INTERESTS

Environmental Engineering

Aquatic Chemistry in Environmental Engineering

Physico-Chemical Principles of Environmental Engineering

Water and Sanitation in Developing Countries

Develop New Courses About Metal Biogeochemistry in Natural and Engineered Environments

OTHER WORK EXPERIENCE

PRIESS (Program for Reorganization and Extension of Public Health Services) – IADB (Inter-American Development Bank)

Tegucigalpa, Honduras

05/02 – 07/03

National Consultant - Healthy Municipalities

PRIESS was a program funded by the Honduran Ministry of Health and the Inter-American Development Bank and Administered by the United Nations Development Program.

Elaborated a detailed study showing the exact location and altitude of each home in the community, and a diagnostic study used by the nongovernmental and governmental organizations installing potable water systems in the area.

Facilitated meetings between community organizations, local government officials, and governmental and non-governmental organizations.

INSTRUMENTATION, ANALYTICAL, AND TECHNICAL SKILLS

Surface and solid characterization techniques: X-Ray Absorption Spectroscopy (XAS - XANES/EXAFS), X-Ray Photoelectron Spectroscopy (XPS), Scanning Electron Microscopy (SEM), and X-Ray Diffraction (XRD).

Aquatic Chemistry: Inductively Coupled Plasma - Mass Spectrometry (ICP-MS), Atomic Absorption (AA), Ion chromatography (IC), Total Organic Carbon (TOC), spectrophotometry, pH probes, and portable kits to perform in-situ measurements.

Microbiological methods: culturing methods (i.e., media specific for Mn and Fe oxidizers and reducers, total coliforms, heterotrophic plate counts, etc.) and 16S-rRNA gene sequencing.

Data processing, analysis and modeling software. Specifically interested in chemical speciation (i.e., MINEQL), reaction kinetics, and performing statistical analyses (i.e., SAS and R).

LANGUAGES

Bilingual (English and Spanish)

PROFESSIONAL SERVICE

Co-organizer (together with Drs. Huichun Zhang from Temple University and Haizhou Liu from the University of California-Riverside) of the symposium “*Surface Physicochemical Processes in Engineered and Natural Systems*” for the American Chemical Society Meeting” in Denver, CO, March 2015.

Reviewer for the Journals: *Environmental Science & Technology*, *Water Research*, *Chemical Geology*, *American Mineralogist*, *Mineralogy Magazine*, *Journal of Applied Microbiology*, *Journal of Electron Spectroscopy and Related Phenomena*, *Water Environment Research*, and *Science of the Total Environment*.

Proposal Reviewer for NSF Geobiology and Low Temperature Geochemistry Program and DOE Experimental Program to Stimulate Competitive Research (DOE EPSCoR) Implementation Grants.

Reviewer, Association of Environmental Engineering and Science Professors (AEESP) Student Service Committee (SSC) Academic Job Application Review, 2013 and 2014.

Mentor for the University of New Mexico Alliance for Minority Participation (AMP) Program.

Research mentor for 2 high school (summer interns), 10 undergraduate and 5 graduate students.

AFFILIATIONS

American Society of Civil Engineers, since 2014.

American Chemical Society, since 2011.

Association of Environmental Engineering and Science Professors, since 2011.

Golden Key Honor Society, since 2009.

American Water Works Association, since 2005.

College of Civil Engineers of Honduras, since 2002; Licensed Engineer in Honduras.

COMMUNITY OUTREACH AND HOBBIES

Collaborator for several non-governmental development organizations from Honduras.

President of the Latin American and Iberian Graduate Student Association (LAIGSA) of Virginia Tech, 2004-2005.

Professional Guitarist; member of the independent record label Costa Norte Records, Honduras.