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Panel Discussion: Ideas for an Enjoyable and Productive Sabbatical

Dr. Jean M. Andino P.E., Arizona State University

Jean M. Andino is a faculty member in Chemical Engineering and Civil, Environmental, and Sustainable Engineering at Arizona State University (ASU). She earned a Bachelor's degree in Engineering Sciences at Harvard University and a PhD in Chemical Engineering at Arizona State University.

Dr. David V.P. Sanchez, University of Pittsburgh

David V.P. Sanchez is an Associate Professor in the Swanson School of Engineering's Civil & Environmental Engineering department and the Associate Director for the Mascaro Center for Sustainable Innovation at the University of Pittsburgh. He serves as the Program Director for the Master's in Sustainable Engineering, the Undergraduate Certificate in Sustainability, the John C. Mascaro Faculty Fellows, and the Sustainability Global Engagement grant. He is the faculty lead for the University Honors College Food Ecosystem Scholar Community.

His research lab, Sustainable Design Labs, focuses on fusing analytical chemistry, sustainability design principles and data analytics to address Water and Sustainability grand challenges. Current thrusts focus on Smarter Riversheds, Microbial Fuel cells and advanced oxidation and separation processes.

Focused on co-creating long term partnerships that synergize community vision with Pitt's core competencies of research and education, Sanchez has built up Pitt Hydroponics in Homewood, founded Constellation Energy Inventor labs for K-12 students, and re-created the Mascaro Center's Teach the Teacher sustainability program for science educators in the region.

As a teacher he designed and created the Sustainability capstone course which has annually partnered with community stakeholders to address sustainability challenges at all scales. Past projects have included evaluating composting stations in Wilkinsburg, studying infrastructure resilience in Homewood, enabling community solar in PA, improving energy efficiency in McCandless Township, and improving water quality in our rivers. He teaches core Sustainability courses, labs in the Civil & Environmental Engineering Department, electives in the Innovation and Entrepreneurship program, the First-Year Engineering program, and International Study Abroad programs.

Dr. Michelle Marincel Payne, Rose-Hulman Institute of Technology

Dr. Michelle Marincel Payne is an Associate Professor in the Civil and Environmental Engineering at Rose-Hulman Institute of Technology. She earned her Ph.D. in Environmental Engineering from the University of Illinois at Urbana-Champaign, her M.S. in Environmental Engineering from Missouri University of Science and Technology, and her B.S. in Nuclear Engineering from the University of Missouri-Rolla (same school, different name). At Rose-Hulman, Michelle is co-leading a project to infuse an entrepreneurial-mindset in undergraduate students' learning, and a project to improve teaming by teaching psychological safety in engineering education curricula. Michelle also mentors undergraduate researchers to investigate the removal of stormwater pollutants in engineered wetlands. Michelle was a 2018 ExCEED Fellow, and was recognized as the 2019 ASCE Daniel V. Terrell Awardee.

Dr. John D. Carpinelli, New Jersey Institute of Technology

John Carpinelli is a Professor of Electrical and Computer Engineering at the New Jersey Institute of Technology and ASEE Campus Representative. He received his Bachelor of Engineering from Stevens Institute of Technology and his Masters and PhD from Rensselaer Polytechnic Institute. He has served in numerous positions throughout his career at NJIT, including Director for the Computer Engineering Program, Executive Director of the Center for Pre-College Programs, and Associate Director of the Institute for Teaching Excellence. He has been designated a Master Teacher at NJIT. His research interests focus on engineering education at the pre-college and undergraduate levels. He is the author of the textbook Computer Systems Organization and Architecture and the upcoming open textbook An Animated Introduction to Digital Logic Design.

Dr. Shannon L. Isovitsch Parks P.E., University of Pittsburgh at Johnstown

Dr. Shannon Parks is a registered Professional Engineer with 20 years of broad-based experience in the water resources and environmental engineering fields. She holds a Bachelor of Science Degree in Civil Engineering from the Pennsylvania State University.

Dr. Daniel B Oerther P.E., Missouri University of Science and Technology

Dr. Daniel B. Oerther, PhD, PE, BCEE is a professor of environmental health engineering at the Missouri University of Science and Technology.

Environmental Engineering Division / New Engineering Educators Division

Panel Discussion: Ideas for an Enjoyable and Productive Sabbatical

Abstract

Navigating the sabbatical process and deciding on a productive activity can be challenging. A sabbatical can take many different forms depending on career goals, interests, and institution. The purpose of this panel discussion is to provide faculty who have yet to conduct a sabbatical with ideas of activities and the process. A variety of personal experiences will be presented of sabbatical activities that were enjoyable and productive. These may include sabbaticals focused on independent engineering research, engineering education research, development of classes or programs, industry or government collaboration, and/or travel. Discussion topics will also include process requirements of applying, conducting, and documenting the outcomes of the sabbatical.

The suggested layout of the panel session is:

- 5-minute introduction of panel topic and panelists
- Overview of each panelist's sabbatical activity (5 minutes each)
- Brief whole group Q&A session to engage audience and panelists
- Small group activities with documentation of Q&A:
 - What resources did you find helpful in planning your sabbatical?
 - What was the timeframe of planning, applying for, conducting, and documenting your sabbatical?
 - What were the requirements of your sabbatical?
 - When or how often have you conducted a sabbatical?
- Bring whole group back together to discuss learnings

Introduction

Navigating the sabbatical process and deciding on a productive activity can be challenging. A sabbatical can take many different forms depending on career goals, interests, and institution. The purpose of this panel discussion is to provide faculty who have yet to conduct a sabbatical with ideas of activities and the process. A variety of personal experiences will be presented of sabbatical activities that were enjoyable and productive. These may include sabbaticals focused on independent engineering research, engineering education research, development of classes or programs, industry or government collaboration, and/or travel. Discussion topics will also include process requirements of applying, conducting, and documenting the outcomes of the sabbatical.

The panel sessions will include a 5-minute introduction of the panel topic and panelists, an overview of each panelist's sabbatical activity (5 minutes each), a brief whole group Q&A session to engage the audience and panelists, and small group discussion. Questions to be discussed include:

- What resources did you find helpful in planning your sabbatical?
- What was the timeframe of planning, applying for, conducting, and documenting your sabbatical?
- What were the requirements of your sabbatical?

- When or how often have you conducted a sabbatical?

Panelist Biographies and Sabbatical Experience

Jean M. Andino

Prof. Andino received her doctorate from the California Institute of Technology in chemical engineering and a Bachelor of Science degree from Harvard University in engineering sciences. Her group's research focuses on chemical kinetics and mechanisms as applied to air quality, atmospheric chemistry and heat/energy themes.

Prof. Andino is currently a tenured Associate Professor, on the faculties of both Chemical Engineering and Civil, Environmental, and Sustainable Engineering in the Ira A. Fulton Schools of Engineering at Arizona State University. In addition, she is the Director of the Western Alliance to Expand Student Opportunities (a multi-million-dollar National Science Foundation funded alliance of 13 academic institutions in Arizona, Utah, and Colorado), and is co-Director of the Southwest Integrated Field Laboratory (SW-IFL) project (a \$25 Million effort recently funded by the Department of Energy to examine links between heat, air composition and water). She was recruited to ASU from the University of Florida's Environmental Engineering Sciences department.

Prof. Andino has past industry experience, working for two years at Ford Motor Company as part of both the Chemistry and Chemical Engineering departments of Ford Research. Her work at Ford focused on (a) characterizing the reactions taking place on novel materials to be used in catalytic converters, and (b) determining the ambient air quality impacts of fuels and alternative fuels by examining their kinetics and mechanisms of reaction.

Prof. Andino has published numerous journal articles, is actively engaged in patenting and commercialization efforts, and is a registered professional engineer. She has earned numerous national and local awards, including (among many others) the Society of Hispanic Professional Engineers (SHPE) 2017 STAR Educator of the Year in Higher Education award from the national SHPE organization, a Fulbright US Scholar Award in Renewable Energy from the US Department of State, and a National Science Foundation CAREER Award in Geosciences for her atmospheric chemistry work at the start of her career at the University of Florida.

Prof. Andino conducted her sabbatical through a Fulbright US Scholar award to the Republic of Panamá. Her Fulbright was hosted by the Centro de Investigación e Innovación Eléctrica, Mecánica y de la Industria (CINEMI) at the Universidad Tecnológica de Panamá (UTP), the primary technical university in Panamá, and was aimed at both teaching and research in the areas of air quality and energy. During her time in Panamá, Prof. Andino taught an Air Quality Engineering course, attended and participated in research workshops and conferences, and gave presentations at various scientific venues sponsored by the faculty at UTP or the US Embassy in Panamá. The sabbatical opportunity expanded Prof. Andino's thinking about science and engineering efforts in other countries.

John Carpinelli

John Carpinelli is a Professor of Electrical and Computer Engineering at the New Jersey Institute of Technology. He received his Bachelor of Engineering from Stevens Institute of Technology and his Masters and PhD from Rensselaer Polytechnic Institute. He has served in

numerous positions throughout his career at NJIT, including Director for the Computer Engineering Program, Executive Director of the Center for Pre-College Programs, and Associate Director of the Institute for Teaching Excellence. He has been designated a Master Teacher at NJIT. His research interests focus on engineering education at the pre-college and undergraduate levels. He is the author of the textbook *Computer Systems Organization and Architecture* and the upcoming open textbook *An Animated Introduction to Digital Logic Design*.

Prof. Carpinelli is on sabbatical during the 2022-2023 academic year. During this time, he is writing an open textbook, *An Animated Introduction to Digital Logic Design*. The textbook is being developed through NJIT's Faculty Authored Open Textbook initiative. The book is completely original, with the exception of a couple of figures from external sources that are reprinted with the copyright owners' permission. The book is targeted toward a sophomore-level digital circuits course typically taken by electrical engineering and computer engineering majors. The book will be completed during summer 2023 and will be used for the first time at NJIT during the fall 2023 semester. Compared to the cost of the textbook currently used in the course, and other comparable textbooks, it is anticipated that students will save over \$100,000 collectively over the first three years of availability.

Unlike traditional textbooks, this book makes heavy use of animation to illustrate the flow of data within circuits. For this reason, the book will be available only in electronic format. Although final publication details have not yet been finalized as of this writing, it is anticipated that the book will be available in several formats, including completely online reading, downloading the text of the book with links to the online animations, and a complete download of the book with animations embedded for fully offline reading.

Daniel B. Oerther

Daniel B. Oerther (pronounced O' thur) is a professor of environmental health engineering at the Missouri University of Science and Technology (2010-present), and previously he was a professor at the University of Cincinnati (2000-2009). Dan is a four time recipient of the Fulbright award, including: Fulbright-Nehru Scholar to the Indian Institute of Science (2005) and Fulbright-Pai Scholar to Manipal University (2005); ALCOA Fulbright Distinguished Chair in Environmental Science and Engineering to Brazil (2012); Fulbright Scholar to King's College London (2020); and a member of the Fulbright Specialist Program. Dan served as a Jefferson Science Fellow for the National Academies of Sciences, Engineering, and Medicine (2014-2019), and a Foreign Affairs Officer in the Secretary's Office of Global Food Security at the United States Department of State (2014-2021). Dan worked as the Project Implementation Coordinator for CCRIF SPC developing the Caribbean Ocean and Aquaculture Sustainability facility (COAST) (2017-19), and currently he works as the Executive Director of the American Academy of Environmental Engineers and Scientists (2022-present). While being employed full-time as a tenured/tenure track faculty member since 2000, Dan pursued multiple professional development activities without formally receiving a sabbatical leave. Dan's presentation will highlight how faculty should explore Ernst Boyer's inclusive model of scholarship in higher education – including discovery, integration, application, and the scholarship of teaching and learning – to create opportunities beyond the university setting to promote personal and professional growth as part of faculty workload including the training of student mentees in the classroom and beyond.

Michelle Marincel Payne, Ph.D.

Dr. Michelle Marincel Payne is an Associate Professor in the Civil and Environmental Engineering Department at Rose-Hulman Institute of Technology. She earned her Ph.D. in Environmental Engineering from the University of Illinois at Urbana-Champaign, her M.S. in Environmental Engineering from Missouri University of Science and Technology, and her B.S. in Nuclear Engineering from the University of Missouri-Rolla (same school, different name). At Rose-Hulman, Dr. Marincel Payne is co-leading a project to infuse an entrepreneurial-mindset in undergraduate students' learning, and a project to improve teaming by teaching psychological safety in engineering education curricula. Dr. Marincel Payne also mentors undergraduate researchers to investigate the removal of stormwater pollutants in engineered wetlands. Dr. Marincel Payne was a 2018 ExCEED Fellow, and was recognized as the 2019 ASCE Daniel V. Terrell Awardee.

Dr. Marincel Payne's recent sabbatical brought her to the civil and environmental engineering consulting world. In her presentation, Dr. Marincel Payne will share the nuggets she learned including the benefits (which out compete) and drawbacks of seeking consulting engineering work as a sabbatical option. These benefits include being able to

- Bring case studies and real-world experience to students
- Be compensated to use engineering expertise at a level more thorough than in undergraduate classes
- Do something completely different than the normal academic routine
- Build collaborations for future work as a consultant myself, and for my students' future job prospects
- Improve my confidence in not only design aspects and approaches, but in impressing upon students the the need for documentation/deliverables/note taking skills
- Embrace feeling vulnerable—this is how many of our students feel

These drawbacks include

- Feeling like she is juggling two jobs at times: her consulting job and her ongoing grant work
- Not having the traditional sabbatical time for furthering traditional academic work

Overall, Dr. Marincel Payne has found the variation in work, the need to become an expert in anything she needs to become an expert in, the challenge to accurately plan her time and execute tasks, and the need to provide deliverables on a timely scale, exciting and enriching. She also has been consulted on some items because some consultants have not dealt with theory or specific items as recently.

In terms of preparation, she reached out to companies, pitched her value, and then worked with the university career services office to negotiate her contract. She hopes to use this experience to leverage future consulting work. She thinks it is important for faculty to be in touch with the daily life of consultants, especially at schools where most of our students go into consulting.

Conclusion

Four panelists shared their sabbatical experience, including international travel through a Fulbright US Scholar award, writing a textbook, and engineering consulting. Their broad experience highlights the varied paths available to faculty in finding personal and professional growth. The importance of including such experience in faculty scholarship is highlighted, particularly in how it can improve teaching effectiveness. These sabbaticals brought added value to each faculty's ability to train and mentor students, bring real-world case studies into the classroom, and enhanced their empathy towards students as they learn something new.