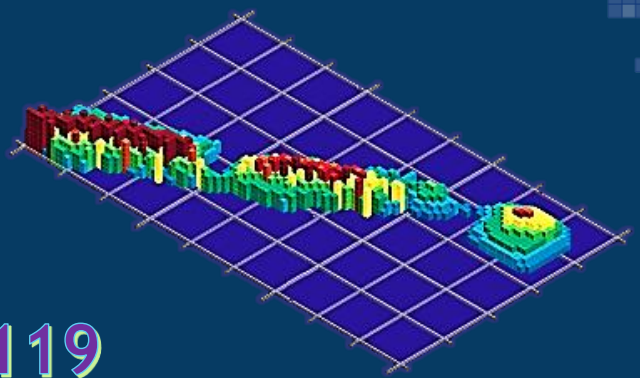
AMERICAN CHEMICAL SOCIETY PITTSBURGH

THE CRUCIBLE



ELEMENT 119 EDITION

CXI No. 7

FEBRUARY 2025

Central Regional Meeting 2024 was a Success!

Thank you to the CERM co-chairs, Matthew Price and Logan Miller, and our organizing committee members for all their efforts in arranging a successful CERM 2024! During November 6 – 9, we had an attendance of 590 people at the Double Tree Hotel in Green Tree.

CERM 2024 hosted a number of events and activities for our community, including:

- 3 Plenary Lectures
- 28 Exhibitors
- 220 Oral Presentations
- 153 Poster Presentations
- 9 Industrial, Social, and Career Workshops
- 3 Special Cocktail Hours and Receptions
- 3 Special Luncheons
- 16 Sponsors
- 6 Award Winners
- 10 Poster Award Winners
- 6 Graduate Schools

Check out some photos from our events!

Technical Session on Wednesday, November 6

Plenary Lecture by Dr. Wesley Transue on November 8

Women Chemists Committee Luncheon with Speaker Dr. Natalie LaFranzo on November 8

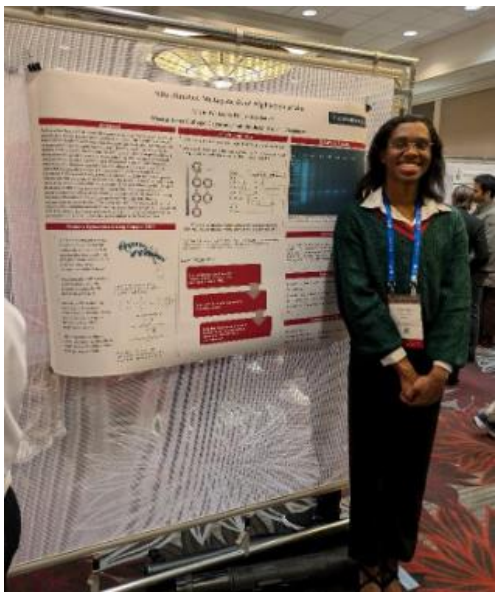
CERM 2024 Travel Grant
Conference Experience Summary

Two undergraduate students (Gabbie Garza ’25 and Kevin Walker ’26) from Westminster College attended the 2024 ACS CERM conference in Pittsburgh PA for the entirety of the conference. Gabbie, who is interested in attending graduate school, attended the grad school fair and was able to get information on several different programs including The University of Pittsburgh and WVU. Gabbie gave an oral presentation entitled “Identifying the Chemical Composition of Kombucha Tea.” Kevin presented his poster entitled “Site-Directed Mutagenesis of Alpha-synuclein” during the undergraduate poster session.

Two Westminster faculty also attended the CERM conference, Dr. Jessica Sarver and Dr. Pete Smith (ACS Division of Professional Relations – Executive Committee Member-at-Large). Dr. Sarver gave an oral presentation on physical chemistry education entitled “Computational Chemistry in the Classroom.” Both attended several other oral presentations, meetings, and the poster session. In addition, a group of seven undergraduate students from Westminster College, attended the undergraduate poster session and plenary talk on Friday night as well as the undergraduate networking session. Dr. Sarver and Gabbie also attended the brewery workshop which was very enlightening and enjoyable.

Dr. Sarver, Dr. Smith, Gabbie, Kevin, and Charlie Moller (one of the attendees Friday night) are all ACS members. Fun and learning was had by all, thank you for the opportunity to attend and present our work at this regional conference and for the travel grant to help off-set the registration costs for our undergraduate students.

Sincerely, Dr. Jessica Sarver



IUPAC Global Women's Breakfast

"Accelerating Equity in Science"

*The **ACS Pittsburgh Women Chemists Committee**, in conjunction with the **Carnegie Mellon University ACS Graduate Student Organization**, presents...*

Olamide Ogundele
Indiana State Dept. of Health Laboratory

Dr. J. Alexandra Hakala
National Energy Technology Laboratory

Saturday, February 8th, 2025
11:00AM - 1:00PM
CMU Doherty Hall 2302 | Pittsburgh, PA

*Please **register** by Monday, January 27th!*

Breakfast will be provided!

SCAN ME

Environmental Lecture Series XV

Wednesday, Feb. 19, 2025
12:00 pm – 1:00 pm (EST)

Teams Meeting:
Meeting ID: 493 479 165 213
Passcode: MZ7d4ui6

Join the meeting now

ACS·Pittsburgh·ENVR
Engaging, Networking, Volunteering, and Responsibility

Organic-Mineral Interactions at the Molecular Level: Implications for Climate, Soils & Health

James D. Kubicki, PhD
Department of Earth, Environmental & Resource Sciences
The University of Texas at El Paso

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Organic-Mineral Interactions at the Molecular Level: Implications for Climate, Soils & Health

James D. Kubicki, PhD, Department of Earth, Environmental & Resource Sciences, The University of Texas at El Paso

Interactions of natural organic matter with mineral and mineraloid surfaces are critical in the environment. Global processes such as C cycling and climate change are heavily impacted by this chemistry. Soil stability and quality depend upon bonding of organic compounds to inorganic substrates which is a major factor in agricultural productivity. Furthermore, the health impacts of mineral aerosols are functions of the surface chemistry of the inhaled particulate matter. When considering C cycling and climate change, one needs to consider that soil organic matter and biota contain approximately four times the C as found in land plants globally. The loss of this organic matter and conversion to CO2 adds to the atmospheric concentration, and more importantly, depletes soils of organic matter critical to water retention and soil health. Thus, as temperatures and droughts increase, many soils are simultaneously losing their resiliency to support plants in the new climatic conditions. The seminal paper of Torn et al. (1997) demonstrated that mineraloids in soils are particularly useful for slowing the organic C turnover rate, so understanding this organic-inorganic interface is imperative. The human health impacts of aerosols is of increasing concern. Mineral dusts are a significant component of the overall global aerosol burden, especially in arid regions such as the U.S. Southwest, the Sahel, the Middle East and China. The direct impacts of particular matter on lung health have been studied for decades, but the role of organic coatings has not been a major focus. Additionally, new research is demonstrating indirect health impacts such as the role of Pb in obesity. Because ingested minerals can be a source of elements such as Pb, As and Hg, the organic coatings on these minerals may impact the bioavailability and risk associated with this environmental stressor.

Dr. James D. Kubicki received his B.S. in Geology from Cal State Fullerton (1983) and Ph.D. in Geochemistry from Yale University in (1990). He worked as a postdoctoral fellow for the Carnegie Institution of Washington, Caltech and the U.S. Navy through an NRC Fellowship before joining the faculty at Penn State in 1998. He was promoted to Associate then Full Professor in Geosciences at Penn State before becoming Chair of Geological Sciences at UTEP in 2015. He has served as Chair and Councilor for the Geochemistry Division of ACS and is currently a member of the ACS Committee on Science. He has published approximately 200 papers, edited four books and has approximately 15,000 citations (h-index = 70).

NOW-Time and Human Consciousness

Armand F. Lewis
Bioengineering Department
College of Engineering
University of Massachusetts-Dartmouth USA

Hi fellow Chemists, how about taking a little time from your busy schedule to do some thinking – "Outside the Box". That's what I did when I came up with the following:
In the context of conscious humankind, time is referenced as the Past, Present (NOW) and Future. In reality, though, once we enter the future, it becomes our past. So basically, the only "time" witnessed by a conscious human is the present or NOW-time. Acknowledge that we all live in a ubiquitous flow of "Earth-time" which is basically composed of a continuum of present or NOW-time moments. The Future then, is simply the frontal, forward moving time-line we encounter as functionally active humans. Furthermore, our Past is unchangeable and stores itself in the realm of our memory and past history.
Continuing, let's suppose we define the flow of Earth-time in terms of a (calculus) integral quantity. Then, if we proceed to differentiate this time-flow parameter, the "NOW" condition can thus be defined as the derivative of always constantly flowing Earth-time. This proposition is described as:

$$\text{"real" Earth-Time} = \int_{o}^{\infty} Ndt + C \text{ (the integral)}$$

$$\text{"NOW-Time"} = \boldsymbol{dN/dt} \text{ (the derivative).}$$

This notation first interprets the "positive flow" of Earth-time as an integral quantity for any human mental or physical action event, ***N***, progressing from zero to infinite time. It's differential, ***dN/dt***, therefore represents the NOW-Time that exists and continuously moves along as the derivative of real time. It's like time is quantized. NOW-Time can thus be described as being, ***N*,** a human functional process; an activity or task being executed per infinitesimally short time period, ***dt***. Human existence can thus be quantitatively defined as being a continuum of functionally real, ***dN/dt***, "NOW" moments. Let's be reminded here that the time concept is a human construct and the "***N***" event represents any conscious human's functional mental or physical activity [1]. This situation poses a question - - Can our description of this NOW-State as **dN/dt,** be considered in the realm of a universal "fifth-dimension"? Can it be added to our already existing three space dimensions of x, y and z plus a fourth flow-time dimension, $\mathbf{t_{(f)}}$? Can the NOW-state (instantaneity-space), $\mathbf{t_{(n)}}$, be added as a fifth-dimension? Quite a profound question for a Chemist - - -So let's proceed.

Observing and locating an object in x, y, z space is easily executed and repeatable within the context of human reality. However, when this space-event happens, time never enters the picture, nor is the event ever reproducible within a particular instant in time. A moment in time is dynamic, it's fleeting, once it's here, within an instant, it's gone forever.
Humanity has metricized Earth-time based on Earth's rotation, in units of one day represents 24 hours (1440 minutes) (8.64×10^4 seconds), etc. It was Einstein that showed us that the flow-rate of time is not constant; time slows down in the presence of high gravitational fields and changes relative to the motion/speed of the measuring observer. This is relativity theory. From this, Einstein showed us that one can combine space and time to become a four-dimension quantity he called ***space-time***. Today, space-time, is universally accepted as the dimension framework with which all our physical universe's mass objects exist, function and are measured. From this perspective, can we consider this described, **dN/dt**, "NOW-State" concept to be in the realm of a complimentary fifth dimension?
Let's first address some questions: (1) Can "units" be assigned to this NOW-State? and (2) Can this state of NOW be "visualized" in any way? and (3) Into what context do the space-time (dimensional state) of this NOW-time exist? Being the derivative of Earth-time, Now-time has been assigned the units of ***dN/dt*** where any

functional event, ***N***, is divided by an infinitely small, time segment, ***dt*** or Event per time. Note there is a difference. NOW-time is an action unit (**per time**) while Earth-time is not. Earth-time units represent a **directly flowing time** parameter; days, hours, minutes, seconds. Obviously, NOW-Time and Earth-Time represent two different time perspectives. Note that addressing the visualization question to NOW-space involves a human construct. On this, be reminded that the flow of Earth-time is invisible. However, Earth-time is aways relatable to outside change; observable (outside the body) surroundings changes. Weather changes, the grass is growing, it's daytime and it's time to eat, it's nighttime and time to sleep; all witnessed real-time human events. These functional activities constantly remind us that time is passing and we are all getting older by the minute.

Addressing the question in the context of reality has led me to conclude that the concepts of Earth-time (space-time) and NOW-time are centered upon two different venues. Earth-time is universal. It exists and is continually flowing along with the fabric of our Universe; it is part our functional Universe. Alternatively, NOW-Space is a totally human consciousness based human construct. To me then, NOW-Space can be called humanity's life-action dimension. Without humans, NOW-Space wouldn't exist.

It seems, then, that NOW-Space can only be interpreted in terms of a personal state of existence; as an inner reality, it can be looked at as our personal "Existence-time" dimension. Live thinking events reside in this NOW-Space. While we are conscious, it is the continuous process of thinking, planning, remembering, executing a decision; all our mental activity is carried out in this humanity NOW-Space. It is what continuously exists and transmits itself through our mind while we are conscious. It's like NOW-Space represents actuality, the experience of living. It's human reality!

Therefore, in my final analysis, I conclude that NOW-space cannot be considered in the realm of a (universal) fifth dimension. The distinction here is that Einstein's space-time dimension exists whether or not there exists intelligent observers. Alternatively, NOW-space is a "personal" dimension, it only relates to intelligent beings, humans. It only applies within the context of the Universe's intelligent human observers. Overall, NOW-Space can be clearly defined as humanity's "Existence-space". From this, let's let x, y, z space and Earth-time stand as they are. With this, let's conclude that the NOW-State is a dimensional concept strictly reserved for describing the realm of human consciousness.

Hey Chemists, any thoughts? [alewis@umassd.edu]

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[1] Lewis, Armand F., (2024) "Consciousness and the State of NOW-Instantaneity Space", J. Consciousness Exploration & Research, Vol. 15, issue 3, pp 218 – 228.

The Crucible

The Crucible is published monthly, August through May. All statements and opinions expressed herein are those of the editors or contributors and do not necessarily reflect the position of the Pittsburgh Section.

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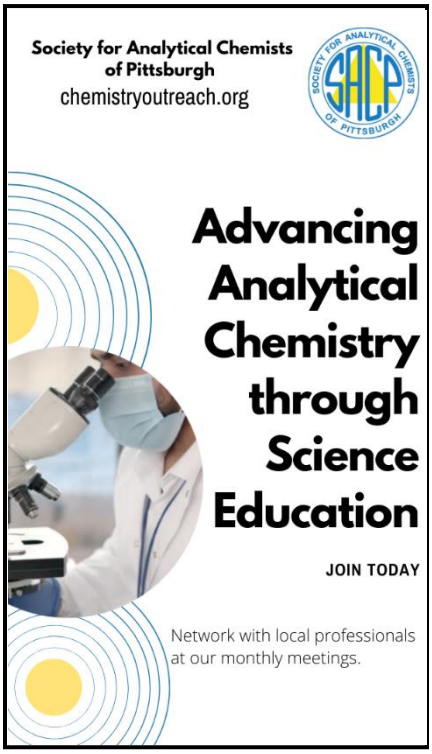

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3.5” x 2”	$50	$45	$25	$20

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We are always looking for new people to join the Pittsburgh Section Executive Committee. Email our Chair to inquire about opportunities.

The Crucible Deadline

The deadline for items submitted to The Crucible is the 15th of the month prior to publication. For example, all items for the March 2025 issue must be to the editor by February 15th, 2025.

ACS Regional Awards – Apply Today!

More information can be found here

COVER graphic

sea of instability