

### November Section Meeting: Atomic Layer Deposition – More Than Just R&D

Many device technologies are progressing towards smaller feature sizes, enabling aggressive form factors, which requires fine control at the atomic scale during materials synthesis. One technique that provides Ångstrom level control over material growth is atomic layer deposition (ALD). Due to the digital growth nature, ALD processes provide a discrete and reproducible amount of film in each cycle, often at sub-Ångstrom thicknesses, conformally coating any feature accessible to the process gas with well adhered thin films. This fine control afforded in ALD allows for unique bulk film structures/compositions such as multilayered or nanolaminate films, where two different films are layered at the nanometer scale. These multilayer films can tune physical properties of the bulk films such as dielectric constant, leakage current, breakdown voltage, gas/moisture barrier performance, and stress, in ways that are otherwise inaccessible with other techniques. In this seminar, I will briefly discuss the basics of ALD, how production tools attempt to overcome the lack of speed and precursor efficiency in ALD, provide some relevant examples of unique properties of

### November Section Meeting

**Topic:** Atomic Layer Deposition:  
More Than Just R&D

**Speaker:** Matt Weiner

**Date:** Thursday, November 16<sup>th</sup>

### TWO RSVP OPTIONS THIS MONTH

**#1 RSVP FOR IN-PERSON MEETING**  
via email to [rockyaiche@gmail.com](mailto:rockyaiche@gmail.com) by  
Nov 14<sup>th</sup> indicating your name and  
number of attendees.

**Location:** Colorado School of Mines  
1500 Illinois St., Golden

**Time:** 5:00 – Dinner  
6:00 – Introduction  
6:05 – Career Discussion  
6:15 – Technical Presentation  
7:15 – Q & A

**Cost:** Free this month for members  
~~\$20 AIChE Members~~  
~~\$10 Students & Unemployed~~  
\$25 Non-members pay at door

### #2 ONLINE RSVP (Free Zoom call)

**Time:** 6:00 – Zoom Call  
**Cost:** Free; After you register, you  
will receive instructions via  
email for joining the meeting.

nanolaminate films, and end with some examples of how ALD is used in high volume manufacturing today.



### ***Speaker Biography:***

Dr. Matt Weimer is Principal R&D Scientist at Forge Nano who specializes in object and semiconductor applications for atomic layer deposition (ALD). With a background in synthetic organometallic chemistry, experience with novel ALD tool development, and device characterization, he has hands-on experience with the full life cycle of ALD. Matt has a BS in Chemistry from the University of Washington and a PhD in Chemistry from the Illinois Institute of Technology with a joint graduate appointment at Argonne National

Laboratory. After a postdoc at Argonne, he joined the R&D deposition group at Lam Research, where Matt spent time on new semiconductor product development. Utilizing his synthetic chemistry background, he developed multiple ALD and CVD solutions, on a variety of tool sets, for a range of applications in both logic and memory. At Forge Nano he identifies and develops novel ALD solutions over a range of applications in the semiconductor space and beyond. Matt has multiple papers, patents, and talks in the fields of synthetic chemistry, ALD, and CVD. In his spare time, he is an avid racquetball player, hiker, traveler, and donates his time to the Denver Center for International Studies Foundation and Rocky Mountain Chapter of the American Vacuum Society.

### **Google Tab Shortcuts**

Here are a few Google tab shortcuts to make your work life easier:

Ctrl + T = Open a new tab

Ctrl + Shift + T = Reopen last closed tab or window

Ctrl + Shift + A = Search all of your open tabs

Ctrl + Shift + T = Will bring back all the tabs if you should accidentally close the window

\*\*Substitute Command for Ctrl when using Macs

### **NEED SECTION TREASURER**

Thank you to Pete Sharpe for his long service as the Treasurer for our Rocky Mountain Section! If anyone is interested in this officer position, please contact Pete at [Pete.Sharpe@emerson.com](mailto:Pete.Sharpe@emerson.com) or any of the officers for more information.

## AIChE Meetings

### 2023

Nov 27-30	<a href="#">ChemE Show</a> Galveston, TX
Dec 7	<a href="#">2023 AIChE Gala</a> New York, NY
Dec 8-10	<a href="#">6<sup>th</sup> Int'l Conference on Microbiome Engineering</a> Berkeley, CA

### 2024

Feb 4-8	<a href="#">28<sup>th</sup> Annual ARC Industry Forum</a> Orlando, FL
Mar 11-12	<a href="#">Renewable Hydrogen Transport &amp; Storage Conference</a> UCLA, CA
Mar 24-28	<a href="#">2024 Spring Meeting &amp; 20<sup>th</sup> Global Conference on Process Safety</a> New Orleans, LA

### National AIChE Contact Info

**AIChE Customer Service Center:**  
(US/Canada): 1-800-AIChE  
(1-800-242-4363)  
(International): 203/702-7660  
**E-mail:** CustomerService@aiche.org  
**Member Services:** 800.242.4363  
**Career Services:** 646.495.1330  
**Awards & Honors:** 646.495.1317  
**Address:** 120 Wall Street, 23<sup>rd</sup> floor  
New York, NY 10005  
**Web Page:** <http://www.aiche.org>

## Rocky Mountain Local Section AIChE Officers

Marc Paffhausen	Chair	406/544-5871 <a href="mailto:marcpaff43@gmail.com">marcpaff43@gmail.com</a>
Nick Skadberg	Program Chair	970/690-7227 <a href="mailto:nick@skadberg.us">nick@skadberg.us</a>
Pete Sharpe	Treasurer	713/409-7360 <a href="mailto:Pete.Sharpe@emerson.com">Pete.Sharpe@emerson.com</a>
Robert Mellon	Secretary	<a href="mailto:mellonr@icloud.com">mellonr@icloud.com</a>
Kevin Milliman	Director	303/515-1027 <a href="mailto:Kmilliman94@gmail.com">Kmilliman94@gmail.com</a>
Mike Moes	Communication	303/915-1238 <a href="mailto:mmoes@ekiconsult.com">mmoes@ekiconsult.com</a>
Dr. Corey Leclerc	New Mexico Liaison	575/835-5293 <a href="mailto:corey.leclerc@nmt.edu">corey.leclerc@nmt.edu</a>
Kevin Cash	Colorado Liaison	303/273-3631 <a href="mailto:kcash@mines.edu">kcash@mines.edu</a>
Kate Morrissey	Montana Liaison	406/994-2289 <a href="mailto:kathryn.morrissey1@montana.edu">kathryn.morrissey1@montana.edu</a>
Dr. Patrick Johnson	U of Wyoming Liaison	303/766-6524 <a href="mailto:pjohns27@uwoyo.edu">pjohns27@uwoyo.edu</a>
Dr. Christie Peebles	CSU Liaison	970-491-6779 <a href="mailto:christie.peebles@colostate.edu">christie.peebles@colostate.edu</a>
James Crawford	Young Professional Chr	406/994-7378 <a href="mailto:James.crawford4@montana.edu">James.crawford4@montana.edu</a>

**Open Liaison for other states including South Dakota and Wyoming**

Laura Moes  
Editor and Web Admin 303/770-2432  
[lauramoes@msn.com](mailto:lauramoes@msn.com)

Rocky Mountain AIChE News is published nine times a year by the Rocky Mountain Local Section (RMLS) of AIChE. Opinions expressed herein are those of the authors and are not necessarily those of AIChE nor the officers of this section.

The objectives of AIChE are to advance chemical engineering in theory and practice, to maintain a high professional standard among its members, and to serve society, particularly where chemical, engineering can contribute to the public interest.

## MEETING SCHEDULE

*The Rocky Mountain Local Section (RMLS) of AIChE generally meets the second or third Tuesday of every month, September through May.*