



## Five questions for Alan Weimer<sup>[1]</sup>

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After working for nearly 17 years at Dow Chemical in Michigan, Alan Weimer thought about moving into academics.

“The fun went away in industry,” he said. “The global economy hit in the late '80s and early '90s and large companies like Dow focused on making easy money by building existing technology plants overseas instead of inventing new technologies at home. I wanted to go into academia to get the fun back by inventing things and working with students instead of working to improve a company's bottom line.”

He knew a few faculty members at the University of Colorado, and he asked them for letters of recommendation. They asked him to apply for a position at CU. Some 17 years after receiving his Ph.D. at the university, he returned as a faculty member.

[3]

Weimer, the H.T. Sears Memorial Professor of Chemical Engineering, directs a research team working with nanomaterials and solar thermal chemical processes. He has received numerous awards over the years and his and his team's research has spawned two companies. He also is an adjunct professor at the Australian National University (ANU) in Canberra and is currently there on sabbatical, doing research.

“It is clear that my industrial experience has had a big impact on my university teaching and research,” he said. “I think it's a mistake that almost no industrial scientists are hired into academia as they have unique experiences that will benefit academics. My hiring at CU was a fluke and it happened at the right place and at the right time.”

### **1. One area of your research is solar thermal water splitting to produce renewable hydrogen. What has been the outcome of this work?**

My research group has been developing active materials and solar thermal processes to split water. We carry out a cycle of two chemical reactions in which we produce oxygen and then hydrogen separately from water using an active material that first gives up oxygen when heated and then picks that oxygen back up when exposed to steam, releasing hydrogen. The keys are that the active material needs to be robust and do this forever without deactivating, and the chemical processing system that allows concentrated sunlight to do this is highly efficient.

My research group is the largest academic research group in the United States for this research and has a unique facility here at CU for carrying out the studies. This is the “holy grail” for a truly renewable hydrogen economy: use water and sun to get hydrogen and then react the hydrogen with oxygen to get electricity and the water back. It won't be commercialized any time soon because of low natural gas prices and no imposed cost on carbon emissions, but the potential is incredible. This can be used to drive fuel cells, both stationary and in vehicles.

### **2. ALD NanoSolutions is a company that is an extension of your lab's research on atomic layer deposition. What did the research find and what is the outcome?**

At CU we discovered that one could functionalize and coat individual particles by atomic layer deposition (termed Particle ALD), including nanosized particles, without gluing those particles to each other. We then developed a chemical process for doing this at large scale. Broad patents were eventually obtained and the company was initially founded as a way to bring research funds into my lab since government agencies did not originally support the work.

Nearly 10 years after patents were filed, skeptical academic scientists were questioning me at major research conferences as to how this was even possible to do since forces between particles will tend to hold those particles together, making the coating of individual particles impossible. We published a series of papers to explain this. Today,

the scientific community has bought in and the industrial world has taken note. This is the lowest-cost process to make particles of this kind with a nanofilm since almost no chemicals are wasted in the process.

Two of the most beneficial and cost-effective applications are in protecting LED-based active particles from deactivating in the presence of moisture and allowing Li-ion battery materials to charge and discharge many more times at high energy than they could without the films (improving lifetime). For the LEDs in particular, one can achieve the same brightness for ALD-coated materials using maybe 75 percent to 80 percent of the energy required as one would using the competing method for protecting the active materials. It is a huge energy saver and has a substantial performance-to-cost benefit. I think we will see both of these applications commercialized extensively over the next few years. Many others will follow.

I'm proud of the fact that we have been able to develop a "platform technology" with many applications from the basic science research in a university lab. ALD NanoSolutions is the commercial technology leader and employer of many CU students who developed this kind of research in the lab.

### **3. What other research or areas of study interest you?**

My interest has always been to try and be first in a field knowing that funding might be difficult as one has to crack the barrier of skepticism (i.e. being told "it can't be done," so, "no funding for you"). I consider that an incredible opportunity if I understand the fundamental scientific aspects well enough to know in fact that it can be done. I try to avoid crowded fields like photovoltaics, fuel cells and even batteries. I think that there is a lot of opportunity in advanced ceramic materials for chemical engineers with applications in nuclear engineering, 3-D printing, water purification and even cement – clearly an area with not much research going on.

### **4. You have won numerous awards and have numerous achievements. Is there one or two for which you are most proud?**

This is probably surprising to readers: I'm most proud of being named Distinguished Alumnus of my high school back in Youngstown, Ohio, and being able to present at their "Honors Assembly." That plaque sits at the top of my wall, and yet this kind of recognition is not normally included in a professional resume.

My father had an eighth-grade education and worked as a laborer for U.S. Steel in Youngstown. My mother was a stay-at-home mom. I was 11 or 12 years old when my father was laid off in the mid-1960s. He then worked three part-time jobs to make ends meet until he finally landed as a truck driver. I will never forget the despair that set in. Although he never had the education himself, he always told me that the path to success – "The American Dream" -- is through hard work and education. When I look at that plaque, I remember him and what he went through to provide for us and the motivation that he instilled in me to succeed.

### **5. Do you have a favorite item or artifact that you keep in your office, and if so, what is the item and what is the story behind it?**

There is a photo of me standing beside a unique chemical reactor at the Dow Chemical Company and an insert in the photo of the building that housed that reactor. I spent 10 years of my Dow career having the honor to work with a great group of scientists and engineers and to have been able to invent that process from a concept – a lab curiosity, through process development, and finally to a commercial plant.

I was almost let go by Dow because I was a maverick and a nonconformist employee, but at the end of the day, I can say that I gave back to Dow more than I took. That unique reactor development was one of those incredible opportunities where I was told a number of times that it wouldn't work, but I knew it would because I understood the fundamentals, and in the end it did!



The University of Colorado's bond rating has been upgraded to Aa1 by Moody's Investors Service.

The rating boost indicates to investors a stable outlook for CU's existing and future bonds.

"The upgrade to CU's rating not only demonstrates confidence in how we operate the university, but also will allow us to realize millions of dollars in interest cost savings in the coming years," said CU President Bruce D. Benson. "Our strategies for how we approach our key revenue streams, as well as our focus on efficiency in our operations, are reflected in this upgrade."

In its credit opinion, Moody's cited CU's "demonstrated success and ongoing momentum of strategic revenue and financial reserve growth, in addition to improving leverage as its pace of debt financed capital investment tapers down."

Increased private support, an impressive research profile, excellent strategic positioning and ongoing tuition revenue also were cited by Moody's as among the reasons for the upgrade to Aa1. Low state funding for operations and capital remains a caveat that Moody's notes to investors.

Additionally, Fitch Rating Service confirmed its existing AA+ rating of CU. At this point, there is only one rating category, Aaa/AAA, for each rating agency that is higher than CU's Aa1/AA+.

"The stable outlook reflects our expectations that CU will continue to record steady student demand and growth in student charges, strong research activity and flexibility to adjust to federal funding challenges, and substantial gift support," Moody's writes in the opinion. "CU's rating, which is now one rating grade above the state's Certificates of Participation rating, reflects the university's favorable revenue growth and diversity to offset state funding limitations."

## Faculty Council approves revisions to conflict-of-interest policy<sup>[5]</sup>

The Faculty Council has passed a motion for approval to proposed revisions in [Administrative Policy Statement 5012](#)<sup>[6]</sup>, which clarifies requirements relating to conflicts of interest in research and teaching.

The council approved the motion at its final meeting of the academic year, May 11 at 1800 Grant St. The changes would take effect in July, pending the approval of President Bruce Benson.

The meeting also included discussion of the upcoming review of Article 5 of the Board of Regents laws and policies. Article 5 is relevant to all faculty, as it entails appointment and evaluation, principles of academic freedom, faculty government, and dismissal for cause and grievances.

Michael Lightner, vice president for academic affairs, is leading the review of academic policies, which is part of the ongoing systemwide review of CU Regent laws and policies. Members of the CU community and the public may track progress and provide input at [this website](#)<sup>[7]</sup>.

"Our current thinking is to try as much as possible to keep the current structure of Article 5, so that if we can reach agreement on particular sections, we can send them forward whether they're changed or unchanged," Lightner told the council. "Trying to get all of Article 5 done at once would be too big a lift."

Lightner said discussions with all campus faculty assemblies will need to take place during the process, with issues potentially pertaining to all of the Faculty Council's committees.

The systemwide review of Regent laws and policies is expected to continue through late next year. It is being led by Patrick O'Rourke, vice president, university counsel and secretary of the board, in coordination with Leonard Dinegar,



senior vice president and chief of staff.

## CU diversity will be celebrated at Denver PrideFest<sup>[8]</sup>

[9]

The University of Colorado is proud to sponsor Denver PrideFest 2017.

The Faculty Council's Lesbian, Gay, Bisexual, Transgender and Queer + (LGBTQ+) committee is rallying participants for the June 17-18 event.

"We are excited to be engaged with this event and to celebrate our diverse CU community and the larger community," the committee announced.

All members of the CU community are invited and encouraged to participate.

Anyone interested in volunteering to help with the CU event booth at the festival or to walk in the parade is asked to contact Faculty Council Administrator [Rian Cheley](mailto:rian.cheley@cu.edu)<sup>[10]</sup>. You will receive more information as [Denver PrideFest 2017](#)<sup>[11]</sup> draws near.

More information: [CU Lesbian, Gay, Bisexual, Transgender, and Queer + \(LGBTQ+\)](#)<sup>[12]</sup>; [Denver PrideFest 2017](#)<sup>[11]</sup>; questions or comments, please email [rian.cheley@cu.edu](mailto:rian.cheley@cu.edu)<sup>[10]</sup>.

## Faculty Course Questionnaire will move fully online in fall 2017<sup>[13]</sup>

## Diesels pollute more than tests detect; excess emissions kill 38,000 yearly<sup>[14]</sup>

## Some mother cells kick DNA damage 'down the road' to offspring<sup>[15]</sup>

## Chancellor memo: 'I am honored to serve'<sup>[16]</sup>



## Zhou selected as interim dean<sup>[17]</sup>

## Wartgow receives honorary CU degree<sup>[18]</sup>

## Landmark \$38 million gift, new partnership make CU Anschutz a national leader in mental health care for veterans<sup>[19]</sup>

## Building Better Babies Symposium set for May 31<sup>[20]</sup>

<sup>[21]</sup>

The [Building Better Babies Symposium](#)<sup>[22]</sup> is set for 8 a.m. to 5 p.m. May 31 at the CU Anschutz Medical Campus.

The specific objectives of the symposium are to empower and inspire University of Colorado scientists and clinicians across career stages, disciplines, and schools to showcase existing strengths on our campus in the area of Developmental Origins of Health and Disease (DOHaD); to catalyze new collaborations and ideas; to review the key mechanisms underpinning early life origins of disease; to explore emerging novel therapeutic intervention approaches; to discuss the impact of the DOHaD perspective on personalized medicine, health care organizations and health care costs; and to help develop the future agenda of the Building Better Babies Program.

The symposium will feature five exceptional keynote speakers, all world leaders in developmental programming, representing the translational and interdisciplinary impact of this rapidly evolving research field. Investigators on the Anschutz Medical Campus are recognized as leaders in this research field and have brought together an exciting and inspiring program.

The Building Better Babies Program, initiated by 60 individual investigators at the campus, is a transformative and multidisciplinary initiative to highlight the critical importance of early life influences on lifelong health and adult disease. It also explores how mechanistic links between an adverse early life environment and later disease can be exploited to develop novel intervention strategies in pregnant women and infants.

The prevailing paradigm for some time has been that disease is largely caused by an interaction between genes and lifestyle. However, the DOHaD concept, now widely accepted and based on both strong epidemiological evidence and studies in animal models, supports that major chronic diseases – including neuropsychiatric disorders, diabetes, obesity, allergies, cardiovascular and lung disease – have their origins in fetal life and early childhood. This transformative discovery has profound public health consequences and will likely change the way we practice medicine.

Registration for the symposium is free, and includes a light breakfast, lunch, and afternoon refreshments. To register for the symposium: <http://bit.ly/bbbsymposium><sup>[23]</sup>

For more information on the symposium: <http://bit.ly/cudenver-drs><sup>[22]</sup>



## Ruth Ellen Kocher appointed divisional dean for arts and humanities<sup>[24]</sup>

## Employee of Quarter Burkart considers campus family<sup>[25]</sup>

## University Perspective Program announces 2017 Graduates<sup>[26]</sup>

[27]

The University Perspective Program at CU has announced its 2017 class of graduates.

Founded in 1987 (and originally referred to as the University Fellows program), the University Perspective Program has an alumni list of over 400 graduates. The program's goal is to provide staff with a broader knowledge of the CU system and its interactions with the Board of Regents, the Legislature, the community and the state.

The program continues to “wow” participants as they are given an opportunity to learn firsthand, through organized visits to each of the four campuses in the CU System, about the unique role and mission of each campus, as well as the CU system office. Participants also learn about the legislative process by visiting the Capitol, and gain insight into the CU Boulder relationship with the city of Boulder.

The University Perspective Program is a testament of the commitment to employee learning and leadership development on the part of CU Boulder and CU system executive leaders. Participants come away from the program as stronger ambassadors of CU Boulder and the CU system.

2017 Graduates:

**Amy Westfeldt**, Office of Advancement **Tracee DeAntoni**, Department of Human Resources **Jessica Oppen**, Office of Admissions **Robert M. Leo**, Facilities Management **Jason Straub**, Institutional Research **Erick Aguirre**, Office of Financial Aid **Laura Snyder**, Office of Information Technology **Lori Black**, Office of Infrastructure and Safety **Lauren Hasselbacher**, Office of Institutional Equity and Compliance **Nicole LaRocque**, Recreational Services **John Helmers**, Leeds School of Business **Lauren Cole**, Aerospace Engineering Sciences **Maria Castro Barajas**, ODECE Pre-Collegiate Development Programs **Beth Myers**, College of Engineering and Applied Science **Quentin McAndrew**, Graduate School **Alicia Turchette**, Women and Gender Studies **Ari Harrison**, Office of Information Technology **Rory Korpela**, College of Engineering and Applied Science  
Coordinated by **Lauren Harris**, Senior Training and Development Specialist

### Links

[1] <https://connections.cu.edu/spotlights/five-questions-alan-weimer>

[2] [https://connections.cu.edu/sites/default/files/wiemer\\_01.jpg](https://connections.cu.edu/sites/default/files/wiemer_01.jpg)



- [3] [https://connections.cu.edu/sites/default/files/wierner\\_02.jpg](https://connections.cu.edu/sites/default/files/wierner_02.jpg)
- [4] <https://connections.cu.edu/stories/cu-bonds-given-significant-rating-upgrade>
- [5] <https://connections.cu.edu/stories/faculty-council-approves-revisions-conflict-interest-policy>
- [6] <https://www.cu.edu/ope/aps/5012>
- [7] <http://www.cu.edu/regents/rlpreview>
- [8] <https://connections.cu.edu/stories/cu-diversity-will-be-celebrated-denver-pridefest>
- [9] [https://connections.cu.edu/sites/default/files/pridefest\\_top.jpg](https://connections.cu.edu/sites/default/files/pridefest_top.jpg)
- [10] <mailto:rian.cheley@cu.edu>
- [11] <http://gbtcolorado.org/pridefest/>
- [12] <https://www.cu.edu/faculty-council/committees/gay-lesbian-bisexual-transgender-and-intersex-issues-glbti-committee>
- [13] <https://connections.cu.edu/stories/faculty-course-questionnaire-will-move-fully-online-fall-2017>
- [14] <https://connections.cu.edu/stories/diesels-pollute-more-tests-detect-excess-emissions-kill-38000-yearly>
- [15] <https://connections.cu.edu/stories/some-mother-cells-kick-dna-damage-down-road-offspring>
- [16] <https://connections.cu.edu/stories/chancellor-memo-i-am-honored-serve>
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- [18] <https://connections.cu.edu/stories/wartgow-receives-honorary-cu-degree>
- [19] <https://connections.cu.edu/stories/landmark-38-million-gift-new-partnership-make-cu-anschutz-national-leader-mental-health-care>
- [20] <https://connections.cu.edu/stories/building-better-babies-symposium-set-may-31>
- [21] [https://connections.cu.edu/sites/default/files/amc\\_building-better-babies-symposium\\_poster.jpg](https://connections.cu.edu/sites/default/files/amc_building-better-babies-symposium_poster.jpg)
- [22] <http://bit.ly/cudenver-drs>
- [23] <http://bit.ly/bbbsymposium>
- [24] <https://connections.cu.edu/people/ruth-ellen-kocher-appointed-divisional-dean-arts-and-humanities>
- [25] <https://connections.cu.edu/people/employee-quarter-burkart-considers-campus-family>
- [26] <https://connections.cu.edu/people/university-perspective-program-announces-2017-graduates>
- [27] [https://connections.cu.edu/sites/default/files/p\\_univ-persp\\_top.jpg](https://connections.cu.edu/sites/default/files/p_univ-persp_top.jpg)