

**Michigan Technological University Academy of Sciences and Arts
Dinner and Induction Ceremony
September 25, 2014**

Good evening everyone! I am delighted to welcome each of you to the 20th Distinguished Alumni Banquet and Induction Ceremony for the Michigan Tech Academy of Sciences and Arts. Twenty years! What a great accomplishment! It is a truly great honor to be presiding here this evening, for this is one of the most satisfying responsibilities of the office I am honored to hold. My name is Bruce Seely, Dean of the College of Sciences and Arts. We are continuing a tradition launched by my predecessor, Max Seel, now the Provost and Vice President for Academic Affairs, who joins us this evening as the representative of the upper administration. Max is here for what likely will be his last Academy induction as provost of Michigan Tech. When this event began, I'm not sure he or anyone else realized how the Academy banquet would become one of the signal events in the intellectual life of the College of Sciences and Arts. Thanks, Max, for all you have accomplished!

In recent years, I've set the stage for the induction of our distinguished alumni and alumnae with historical musings (I am a historians of science and technology after all!) about various aspects of the College. I think it is worth noting that our first inductee earned her degree in the medical laboratory sciences program (MLS), one of the oldest components of the Biological Sciences Department. Indeed, laboratory sciences began in the late 1940s and actually *predates* formation of the department by at least 15 years. My reason for singling this program out tonight is its position as the earliest clinical education program at Michigan Tech. By the early 1970s, it enrolled perhaps the largest group of undergraduates in the College – more than 150 majors. Sadly, Jack Holland who was such an instrumental force in the program at that time passed away within the past year. We are working to encourage more students today to look at this educational option – it has definite career options for our graduates! To be fair, laboratory sciences was not the only clinically-focused program Tech has ever offered, for nursing had a place here until the budget crisis of the early 1980s prompted the transfer of that program to

Suomi College— now Finlandia University. But MLS now has company, thanks to the inauguration of another clinical program, this time in partnership with Central Michigan University. A cohort of a dozen students are now enrolled in Central's Doctor of Physical Therapy program on our campus, and we envision preparing therapists for hospitals in Upper Michigan, among other places, and developing a combined DPT/PhD program as well. Thus the past and present come together quite nicely.

Chemistry, on the other hand, has a rather shorter history in the College, since the department did not even exist on its own until the late 1990s! As was true at many engineering schools, chemistry and chemical engineering were a combined department here until Max Seel spent almost three years working to bring chemistry into the College with the other scientific disciplines. Today there is perhaps more life sciences research in chemistry compared to when our inductee graduated, and more attention to environmental topics as well. But there is one significant continuity in chemistry—the building that houses the department and its labs. Sarah Green reported a couple of years back – with some concern, I should add -- that a visiting alum had commented that the labs had not changed in about 30 years. It's nice we can provide nostalgic trips down memory lane for our alumnae, but it's more important that the facilities of the department meet best practices and modern safety expectations. Thus we are exploring upgrades and additions to meet the needs of faculty and students alike in chemistry and in the areas of human health.

It's important that we do this, because chemistry remains such a vital area of the modern scientific enterprise. Indeed, historians of science have the pleasure of reviewing the efforts of so many intriguing individuals in this discipline and have made a difference through good science. There is Priestly, the discoverer of oxygen; Lavoisier, the pioneer of analytical techniques; Fritz Haber, noted for both nitrogen fixing techniques and poison gas warfare; the Curies and their pioneering work on radium and radiation; and Glenn Seaborg, their intellectual follower as the *maker* of plutonium and other created elements. And then there is Mendeleev, author and proponent of the periodic table. Perhaps few of you are aware that Mendeleev made beautiful suitcases for a hobby? More interesting perhaps is the fact that his organizational table initially

encountered much skepticism. Often new science has to struggle for acceptance, but for Mendeleev acceptance came only after a Frenchman identified a new element (gallium) in 1875 that fit perfectly into a gap he had left directly below aluminum. Moreover, gallium had the precise atomic weight Mendeleev had predicted. Further support came in 1879 when a Swedish scientist at Uppsala identified the new element scandium that fit perfectly between calcium and titanium. Then germanium was identified in 1886 to fill the position between silicon and tin. But as general acceptance arrived, Mendeleev himself initially rejected the discovery of the noble gases, which he had failed to predict. He disputed rather vociferously the first reports of helium and argon, and ironically, the absence of a place for those elements in his table seems to have cost Mendeleev a Noble Prize in 1906.

There is a point to all of this -- that the importance and consequences of science and scientific discoveries are never clear cut or obvious at the outset. Change does not come easy--as the example offered by Mendeleev himself indicates. Moreover, few observers accurately anticipate where the real impacts of the discovery of new elements – or new knowledge of any kind – will occur. This point certainly is demonstrated by a number of delightful vignettes in Hugh Aldersly-Williams's delightful book, *Periodic Tales: A Cultural History of the Elements from Arsenic to Zinc* (2011). I was especially interested by the connections he identified between chemistry and the arts. Williams demonstrates that artists often were especially interested in new chemical compounds that permitted novel and interesting colors. The discovery of cobalt, for example, in 1735 opened the way to amazingly blue blues in paints – although without even knowing why, makers of glass had used the element for centuries. Medieval stained glass windows had been made using ores from central Europe containing what was later known to be cobalt to make very deep blue glass. The first examples were in Abbe Suger's beautiful church at St. Denis just outside of Paris, and the material spread widely. Art thus both relied upon and stimulated the science behind that discovery.

The discovery of cadmium and other heavy metals more than a century later also was important for painters, since compounds including these metals produced an amazing pallet of brilliant, pure colors – yellows, orange, red, maroons. Art historians tend to celebrate artists such as

Monet and Renoir for the initiation of dramatic new styles of painting during the mid 19th century – especially Impressionism. But in this case, we should not ignore the impact of the new pigments that allowed the artists to pursue their new style. Yet to further complicate the story of understanding scientific change and its impact, paint pigments often have exhibited unanticipated side effects, another all-too-frequent dimension of scientific change. The new heavy-metal pigments based on cadmium sulfides and yellow lead chromate proved to be very damaging to human health. But this was not new – vermilion, for a long time the source of brilliant flame-reds, relied upon very dangerous mercuric sulfide, while many greens were very rich in arsenic. Yet in spite of these dangers, even today some artists lament the shift to much safer – but sometimes less brilliant -- colors.

I'd like to draw a rather postmodern conclusion here, highlighting how the benefits and difficulties of novelty often are intertwined. As I observed before, discoveries almost never have simple linear trajectories. And change is rarely accepted easily and implemented without consequences. But our tale of better living through chemistry in the world of art not only shows the two-sided character of discovery and change, but also indicates how far the impacts of science reach beyond the obvious large-scale economic changes society tends to highlight. This linkage of chemistry and art, rather like the bridges we build between engineers and science students, offers a fine symbol of what this College is all about -- improving society while educating student who can grasp the many nuanced ways in which science and technology influence the world in which we live.

Well, I've wandered enough, I suspect. So let us turn to the people who justify our presence this evening.

We are here to honor two distinguished graduates of the College of Sciences and Arts, **Stephen Hahn** a graduate from the **Department of Chemistry** and **Dr. Carol Kolinsky** a graduate from the **Department of Biological Sciences**. Inductees into Michigan Technological University's Academy of Sciences and Arts must meet several criteria. They must have graduated from a program of the College or one of its predecessors. They also must have brought distinction to

themselves, their academic department, the College of Sciences and Arts, and Michigan Technological University through participation, commitment, and outstanding leadership in their profession and through public service. Election to the Academy publicly recognizes our appreciation and pride in those alumnae and alumni for their exemplary achievement and professional excellence. Members of the Academy now include distinguished academics, leaders of industry, members of the National Academy of Sciences, a Hollywood executive, and the University's sole winner of a Nobel Prize - Melvin Calvin (1964). An engraved plaque with a photograph of the recipient will be displayed in the Walker Arts and Humanities Center to serve as an inspiration for our current students and for our faculty and staff. Michigan Tech is committed to graduating superbly educated individuals who serve their professions, students prepared to thrive in the arenas of graduate and professional schools, and leaders who have a sense of the various influences of science, technology, the liberal arts, language, and arts on all of our lives. The members of the Academy and those to be inducted this evening have shown these qualities in their exemplary careers and lives. They are inspirational role models who have provided a splendid example for all of us.

The College provides Academy members with a plaque to remember this occasion. In addition, we also present each of our inductees with a beautiful, original photographic image of the Keweenaw taken by emeritus Humanities faculty member and superb photographer Joe Kirkish. The pictures are chosen because they capture the beauty of the Copper Country that surrounds Michigan Tech and which forms such a large part of the memories of so many of our graduates.

According to our traditions, a department chair introduces each new member to be inducted. To begin this evening's ceremony, let me ask Shekhar Joshi, chair of the Department of Biological Sciences, to start this process for us.

Shekhar Joshi:

On behalf of the Department of Biological Sciences it is my privilege, this evening, to honor an alumnus of the department and to induct her into the MTU Academy of Sciences and Arts.

It is now my great pleasure and privilege to extend the compliments and congratulations of my colleagues to **Carol Kolinsky's** distinguished career achievements and to recognize her with the induction into the Michigan Tech Academy of Sciences and Arts. Unfortunately, a scheduling conflict arose, and Dr. Carol Kolinsky is unable to join us this evening. We plan to visit her in the near future and deliver to her the mementos of our esteem and gratitude.

Dr. Carol A. Kolinsky graduated from Michigan Technological University in 1974 with a BS in Medical Technology. Carol was employed for six years as a medical technologist before returning to school to earn her medical degree from Michigan State University, graduating in 1984. She completed a one-year rotating internship at the William Beaumont Hospital in Royal Oak, MI and completed two years of family practice in Tiptonville, TN to pay back her government sponsored Health Corp loans for medical school. She returned to William Beaumont Hospital and completed an ophthalmology residency. In June of 1990, Dr. Kolinsky opened her private practice in Escanaba and soon after the practice started, she formed U.P. Ophthalmology as a professional corporation in practice with Dr. Darrell Kohli.

She is an active member of the American Academy of Ophthalmology, Michigan State Medical Society, Delta County Medical Society, and Michigan Ophthalmologic Society. She has been chairman of the Department of Surgery at St. Francis Hospital in Escanaba twice and also has served as Chief of Staff.

Dr. Kolinsky resides in Escanaba with her husband Tom. She has two grown children of whom she is very proud.

At this time, I would like to call on Cary Chabalowski, Chair of the Department of Chemistry to continue with the proceedings

(Cary Chabalowski:

It is my privilege, this evening, to honor a distinguished alumnus and to induct him into the MTU Academy of Sciences and Arts. As spokesperson for the department let me say how

delighted we all are to recognize Stephan Hahn with this honor. Would Stephen Hahn please come forward.

Stephen F. (Steve) Hahn is from Midland, MI and earned his BS in Chemistry from Michigan Technological University in 1982 and an MS in Chemistry from Central Michigan University in 1990. Steve joined The Dow Chemical Company in 1982 and has worked in a variety of research and new business development functions since that time. He currently heads Dow's Ventures and Business Development group in the San Francisco/Silicon Valley area. He holds 41 issued U.S. patents and numerous international patents, and has authored 40 publications in refereed journals and 6 chapters in scientific reference books.

Steve was named Dow Inventor of the Year in 1990 and 1996, delivered the Distinguished Alumni Lecture at Michigan Tech in 1996 and 2003, and received the Dow Excellence In Science Award in 1999. He was a Visiting Professor of Chemistry and IPrime Scholar at the University of Minnesota in 2002. He received the American Chemical Society Cooperative Research Award in 2008 and the Council for Chemical Research Collaboration Award in 2010. Steve has represented Dow on several advisory boards including those at the University of Connecticut Institute for Materials Science and at Michigan Tech. He currently serves on the advisory board for the Global Social Venturing Competition at the Haas School of Business at UC-Berkeley and the Innovation Grant Committee at the Lawrence Berkeley National Laboratory.

Stephen is here tonight with his wife Laura.

It is now my great pleasure and privilege to extend the compliments and congratulations of my colleagues to **Stephen Hahn's** distinguished career achievements and to recognize him with the induction into the Michigan Tech Academy of Sciences and Arts.

Closing Remarks, Bruce Seely:

I always feel so good after this event, for it is a tangible connection between the present and those who built this university and those who attended and graduated from it. Our commitment to educational excellence is enduring, even as the nature of that education keeps changing as the world around us changes. For Steve and Carol, this place represented an early step in their careers, one that provided them with solid understandings of science and nature. When they began, Tech took special pride in providing a high-quality education at an affordable price. This university was part of a great social experiment at the state and federal levels in the years after World War II that tested the idea that education could unlock not only our knowledge of nature, but also the talent of the American people. The expansion of education made possible by the GI Bill and by the decisions in almost every state to develop high-quality university experiences not only powered the American economy for more than 60 years, but also allowed perhaps the greatest era of genuine social mobility in history.

Today Tech continues to prepare students for a world that is changing faster than ever, one in which science and technology – and the social and humanistic understanding of those activities – matter more every day. We need to be sure that we help students to open doors to new possibilities for society and to promising and rewarding careers for our graduates. I hope that Steve will not mind if I share a story that highlights, at least for me, why we need to prepare students who can create the future – and the challenges they may face. Moreover, the story brings to mind the anecdote about Mendeleev I told earlier. About a year ago, Steve talked about working for Dow in Silicon Valley, and the novel ideas he was encountering. Not all were great, but one related to precision agriculture sounded very good -- using data, remote sensing and other tools to precisely provide plants with the exact amount of nutrition, moisture and other chemicals they needed. He urged the ag chemical people at Dow to invest in this start-up, but apparently it seemed too far-fetched or uncertain. A few months later, however, a rival firm made a much-publicized acquisition of that company – prompting Dow officials to ask Steve why he had not alerted them to this opportunity! Change comes hard – and the ability to anticipate the future is never easy -- not just for scientists and universities!

My fear is that the changes we are now making in that post-World War II educational experiment will constrict the ability to both find those novel ways of doing things and then to connect them to industry – both in the US and elsewhere in the world. States have decided that parents and students must bear much more of the burden of education costs, while the federal agencies that have been driving R&D are trimming budgets sharply. In this climate, Tech and similar technological universities have been forced to raise tuition to deliver an expensive education. We are beginning to be out of reach for many potential students.

Worse, all too many voices are actually questioning the value of education. A recent article claimed, “Higher education [was] on Trial.” I never thought Lou Glazer, President of Michigan Future, Inc., would feel compelled to write, “A four-year college degree remains best bet for well-paying, secure career.” Just ten days ago, Eduardo Porter felt compelled to state in a column in the *New York Times*, “A Simple Equation: More Education = More Income.” Most of us in this room believe a much more complex equation needs to be kept in mind, for good jobs are only the start of things. Truly educated people, able to learn, to contribute to society as well as to their employers, and able to think and understand the world around them, are this nation’s – and the world’s -- best hope. We are working to insure that our students will be able to recognize the ways novelty can be an asset, and to anticipate and mitigate the inevitable challenges that accompany change. But such educations are no longer free or cheap.

I submit that our inductees this evening, in common with the 55 members of the Academy of the College inducted before, constitute living and breathing proof of the deep and enduring value of a great education. We are fortunate that this event annually reinforces that understanding. I wish we could convey this insight to those who question the value of education at institutions like Michigan Tech. So I am grateful indeed for the example of our inductees. Not only has Steve had great interactions with our students today, but he and Carol have also provided a great reminder of why we are here. All of us take intense satisfaction from the opportunities we are privileged to pursue -- to teach, to be scholars and researchers, and to explore questions that excite us. But best of all, we get to bring our students along with us. And Steve and Carol, like the other members of the Academy, let us see where our students can go.

It is time for me to bring this wonderful evening to a close. We have enjoyed good food, delightful jazz, pleasant surroundings, and good company, topped off by the satisfaction of seeing two very deserving graduates honored for their achievements. I am so pleased that Steve could join us from California; and sorry indeed that Carol could not be with us this evening. I am equally pleased that our faculty can share in this ceremony. I wish to thank Steve for the time he spent with our students and faculty today, talking to them and inspiring them in the process. I wish only that more of our students could hear his words this evening – but we know some of them will be here someday, thinking back themselves about how they started on the roads to their careers.

Let me thank all of you for spending the 20th anniversary evening with us.