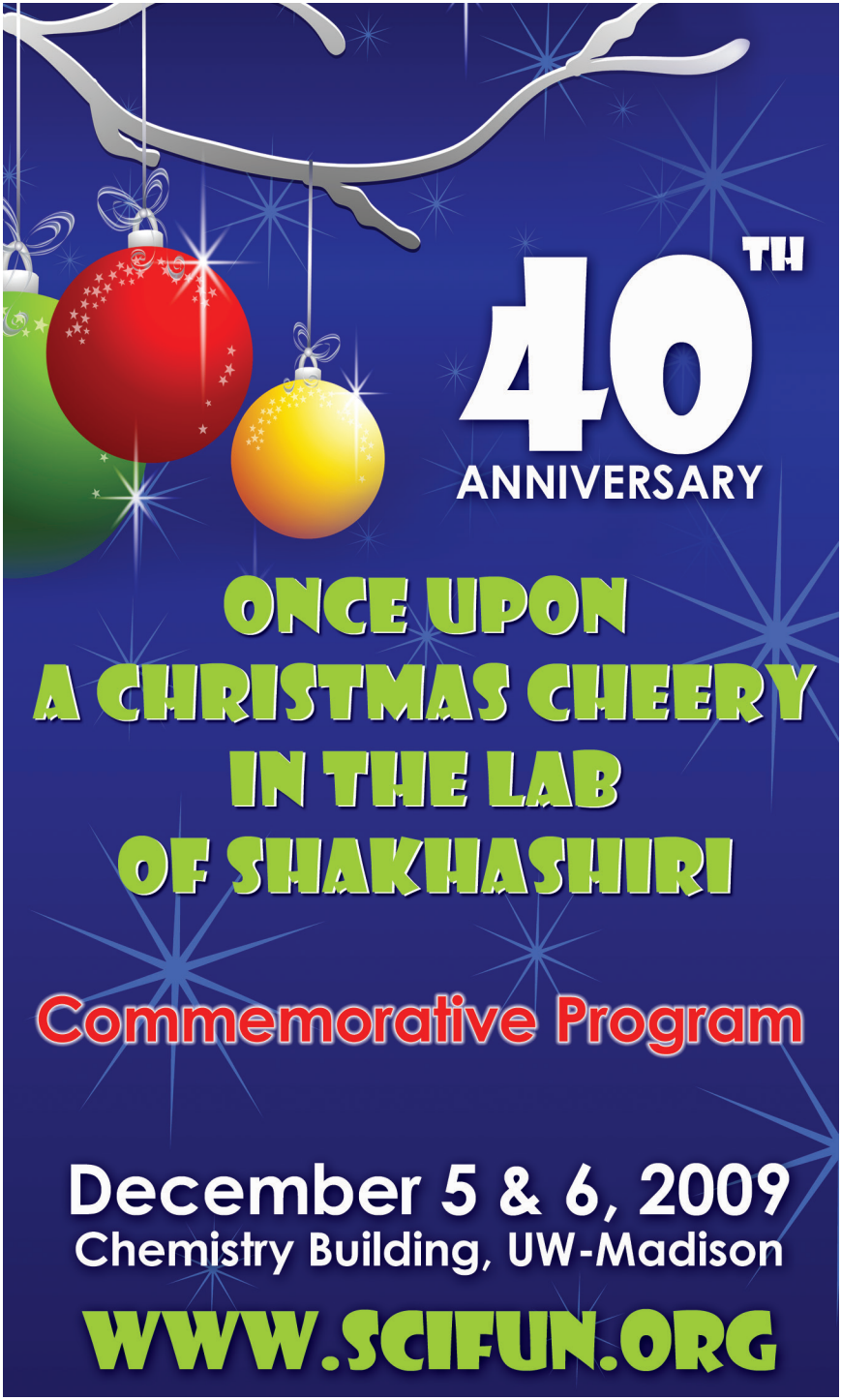
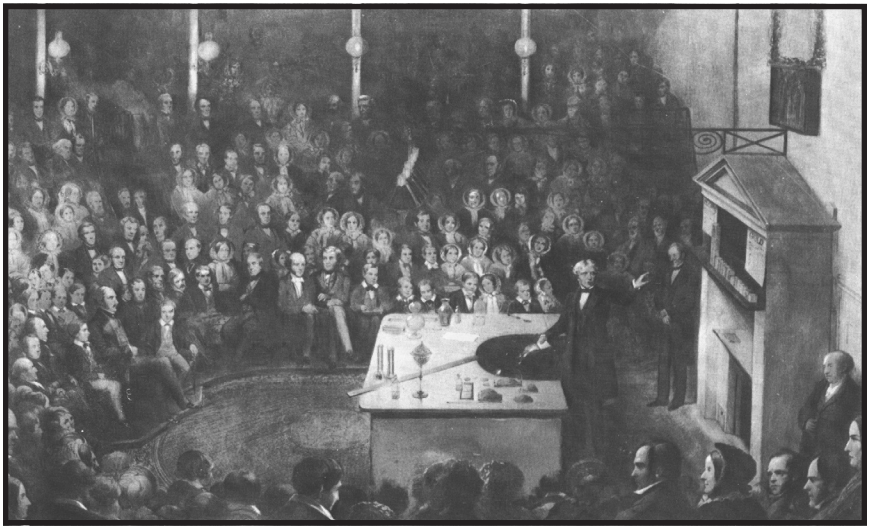

40TH
ANNIVERSARY
ONCE UPON
A CHRISTMAS CHEERY
IN THE LAB
OF SHAKHASHIRI
Commemorative Program
December 5 & 6, 2009
Chemistry Building, UW-Madison
WWW.SCIFUN.ORG

Origin of the Christmas Lecture



Michael Faraday, the noted English physicist and chemist, lived from 1791 to 1867. He was a gifted lecturer who began giving his Christmas Lectures for children and their families at the Royal Institution of Great Britain in the 1840s. Faraday loved simplicity, and he had a strong sense of the dramatic. His audience entered wholeheartedly into the world of science with his guidance. His ideas were still considered very unorthodox at that time, and children, who had not yet adopted conventional ideas, would react enthusiastically to the ones he presented. Eventually, the lectures became very popular, and even the Prince of Wales attended and learned about the mysteries of electricity. Faraday sought to awaken the sense of wonder in his listeners. He knew that once a person could be made to wonder about the world, it was only a short step to studying it. He strove to point out that if you looked closely at the most ordinary thing, such as the force of gravity, it ceased to be ordinary and became somehow miraculous. Throughout the 19 annual Christmas Lectures that he presented, Faraday did all he could to urge his listeners to see and judge for themselves, to experiment – to question nature directly – whenever anyone discovered something out of the ordinary.

Zirconium

40
Zr

The featured element in this year's 40th anniversary Christmas Lecture is zirconium, the element whose atomic number is 40. Zirconium is probably best known for one of its compounds, zirconium dioxide, which can be formed into a gemstone called cubic zirconia, the most popular substitute for diamond. It's difficult to make cubic crystals from zirconium dioxide, and cubic zirconia gemstones were first made in the early 1970s. These "fake diamonds" are almost as hard as diamond and sparkle like diamonds, so it's hard to tell them apart. While both gemstones sparkle, they refract light differently. Cubic zirconia sparkles more colorfully, while diamonds are brighter. One sure way to tell them apart is to test their ability to conduct heat. Diamond conducts heat very well, but cubic zirconia is very resistant to heat flow.

Pure zirconium metal is also very heat resistant, hard, and tough. Furthermore, it does not become radioactive when exposed to neutrons escaping from radioactive material. These qualities make it ideal for lining nuclear reactors and for the casings for nuclear fuel rods. It's also used in other applications requiring heat resistance, such as the combustion chambers of jets and rockets, catalytic converters and furnace bricks, and it's sometimes added to steel and ceramics to increase their heat resistance.

Zirconium occurs naturally in the mineral zircon – a compound of zirconium, silicon and oxygen – which has been known and used as a gemstone since ancient times. Zirconium was first identified as an element by German chemist Martin Klaproth in 1789. It was first separated from the mineral by Swedish chemist John Jacob Berzelius in 1824. Because of its hardness and its resistance to heat and radiation, zirconium is a very useful element, and, in the compounds zircon and cubic zirconia, it's also very beautiful.

Bassam Z. Shakhashiri is professor of chemistry at the University of Wisconsin-Madison and the first holder of the William T. Evjue Distinguished Chair for the Wisconsin Idea. The *Encyclopedia Britannica* cites him as the "dean of lecture demonstrators in America."

♦He has given over 1300 invited lectures and presentations around the world. He has been featured widely in the media including the *New York Times*, *Washington Post*, *Newsweek*, *Time*, the German language *Business Week*, NBC Nightly News, National Public Radio, CNN, and the Larry King show. He appears as a regular guest of Larry Meiller on the Ideas Network of Wisconsin Public Radio.

♦He is the recipient of seven honorary doctoral degrees and over 35 awards, including the 2003 American Association for the Advancement of Science Award for Public Understanding of Science and Technology, "for his tireless efforts to communicate science to the general public, and especially children."

♦Inducted in 2004 into the Hall of Fame of the national chemistry fraternity Alpha Chi Sigma.

♦In 2005, received the Madison Metropolitan School District Distinguished Service Award for a Citizen, the CHEMICAL PIONEER Award from the American Institute of Chemists, the American Chemical Society Helen M. Free Award for Public Outreach for "lifelong accomplishments and for explaining and demonstrating science with charisma and passion," was elected Fellow of the Wisconsin Academy of Sciences, Arts and Letters and cited in the Answer Book of Capital Newspapers as "the coolest UW professor."

♦Rotary Senior Service Award from the Rotary Club of Madison, 2006.

♦National Science Board 2007 Public Service Award for "extraordinary contributions to promote science literacy and cultivate the intellectual and emotional links between science and the arts for the public."

♦Inaugural Emerson Science Advocacy Medal from UNLV, 2008.

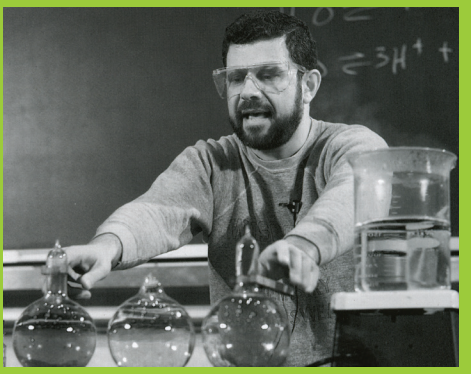
♦Bassam and his wife June live in Madison. Their daughter Elizabeth, a 2007 alumna of UW-Madison, will graduate in May 2010 from the University of Michigan Law School.

MILESTONES

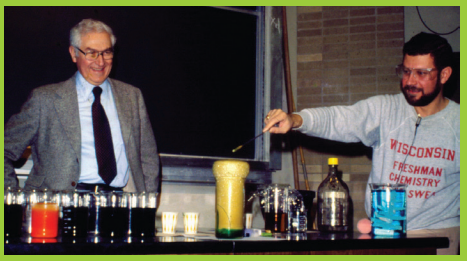
1939: Born in Anfe, El-Koura, Lebanon.
1956: High school diploma; enrolled at American University of Beirut.
1957: Arrived in USA with parents and two younger sisters; father on sabbatical leave from AUB to Harvard School of Public Health.
1960: A. B. degree in chemistry from Boston University; Teaching Fellow at Bowdoin College, Brunswick, ME for one academic year.
1964: M.Sc. degree in chemistry from the University of Maryland.
1968: Ph.D. degree in chemistry from the University of Maryland; joined University of Illinois-Urbana as post-doctoral fellow for nine months; appointed visiting assistant professor.
1970: Joined UW-Madison as assistant professor of chemistry; first UW Christmas Lecture: ONCE UPON A CHRISTMAS CHEERY IN THE LAB OF SHAKHASHIRI.
1974: Naturalized as US citizen in Madison by Judge James E. Doyle, Sr.
1976: Associate professor with tenure; general chair American Chemical Society 4th Biennial Confer-ence on Chemical Education.

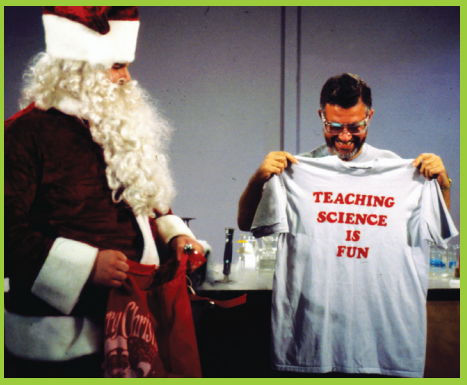
1977: Founding chair of UW System dergraduate Teaching Improvement Council.
1980: Full professor.
1981: Chair, ACS Wisconsin Section; Chair Division of Chemical Education.
1983: Founding director of the Institute Chemical Education.
1984: On leave from UW-Madison to serve as National Science Foundation Assistant Director for Science and Engineering Education and charged with rebuilding its education programs after being essentially eliminated in the Reagan Administration.
1989: 20th anniversary Christmas Lecture in Madison, Smithsonian Air & Space Museum in Washington and Boston Museum of Science.
1990: Returned to UW-Madison after setting NSF education programs on a trajectory to their current budget of about $900 million.
1999: 30th anniversary Christmas Lecture.
2002: Founding director of Wisconsin Initiative for Science Literacy.

40 YEARS OF ONCE UPON A CHRISTMAS CHEERY,



IN THE LAB OF SHAKHASHIRI ... AND BEYOND!






IS FUN


39


CHEMISTRY
CAN BE
FUN


SCIENCE IS FUN


Wisconsin
Public Television
BORAX

Mayoral Proclamation • City of Madison, Wisconsin

WHEREAS, for 30 years our community has celebrated the Holiday Season with a special gift from UW-Madison chemistry Professor Bassam Z. Shakhashiri. His annual show "Once Upon A Christmas Cheery In The Lab of Shakhashiri" is eagerly awaited by kids and adults alike.

WHEREAS, the show is Dr. Shakhashiri's way of proving that "science is fun" (the legend on a T-shirt he dons for the show). By demonstrating how much fun it can be, Dr. Shakhashiri seeks to impart the joy of discovery that has aroused young minds throughout history. This excitement, he believes, will lure future generations to careers as researchers, entrepreneurs and teachers on whom the nation's continuing economic health and national security will depend. More importantly, he advocates the achievement of literacy in science, mathematics, and technology among those who choose other pursuits. He believes it is essential for the well being of our society that all citizens develop an understanding and an appreciation of science, the benefits of technology, and the potential risks associated with advances in both.

WHEREAS, we are fortunate and thankful that Professor Shakhashiri invites us to his lab to share in the joy of science and to learn how to do scientific experiments safely. His exciting program has become a tradition no only in Madison but is enjoyed by large television audiences on PBS. His guests have included Santa Claus, Bucky Badger, the Mayor of Madison, Nobel prize winners, and the vice president of the United States.

NOW, THEREFORE, BE IT RESOLVED THAT on this 30th Anniversary of "Once Upon A Christmas Cheery In The Lab of Shakhashiri" I, Susan J.M. Bauman, Mayor of the City of Madison, proclaim today, Sunday, December 12, 1999 to be

BASSAM Z. SHAKHASHIRI DAY

FURTHER BE IT RESOLVED THAT on behalf of all Madisonians I salute Professor Shakhashiri for his outstanding accomplishments in enriching the traditions of our Community. Thank you Professor Shakhashiri and Happy Anniversary.

Susan J.M. Bauman, Mayor

Signed and sealed this 12th day of December, 1999, at City Hall.

Wisconsin Initiative for Science Literacy

The dual mission of WISL is to promote literacy in science, mathematics and technology among the general public and to attract future generations to careers in research, teaching and public service. Science literacy is important because it allows all of us to make informed decisions in a world that relies daily on science and technology. It is essential for the well-being of our society that all citizens develop an appreciation of science, the benefits of technology, and the potential risks associated with advances in both.

Concert at Chemistry

At the first ever concert held in the Chemistry building, we showcased the bonds between science, the arts and the humanities.

Women in Science

We encourage the participation of girls and young women in science by making them aware of role models and examining efforts of these models in the advancement of science. WISL emphasizes mentoring, decreasing isolation and stereotyping, and creating supportive environments.

Experiments You Can Do At Home

To help learners explore the world of chemistry, we provide an array of at-home experiments where kids of all ages can engage in scientific exploration.

This Year's Guests

Rodney Schreiner, Senior Scientist at UW-Madison, has presented science shows in a wide variety of locations including the Epcot Center and has collaborated with Prof. Shakhashiri on 39 Christmas Lectures.
Bucky Badger has participated in all 40 of Prof. Shakhashiri's Christmas Lectures, and he always obeys the safety rules!
C. Marvin Lang, Emeritus Professor of Chemistry, UW-Stevens Point, has presented hundreds of demonstration shows around the world.
Mike Leckrone, Professor of Music and Director of Bands, UW-Madison, has delighted audiences for over 40 years in a wide variety of venues. Today he is joined by members of his **UW Marching Band**.

Acknowledgements

The 40th Anniversary Christmas Lecture is made possible through the cooperation and support of:

University of Wisconsin-Madison
Department of Chemistry
School of Music
Wisconsin Public Television
Public Broadcasting System
The University Book Store
Donors to WISL

Become a Donor to WISL

You can join Professor Shakhashiri and his friends in supporting the Christmas Lecture and other WISL programs by sending a gift to the University of Wisconsin Foundation. You may send your tax-deductible contribution to:

Shakhashiri Science Education Fund (Attn. Wendy Richards)
University of Wisconsin Foundation, P.O. Box 8860
Madison, WI 53708-8860

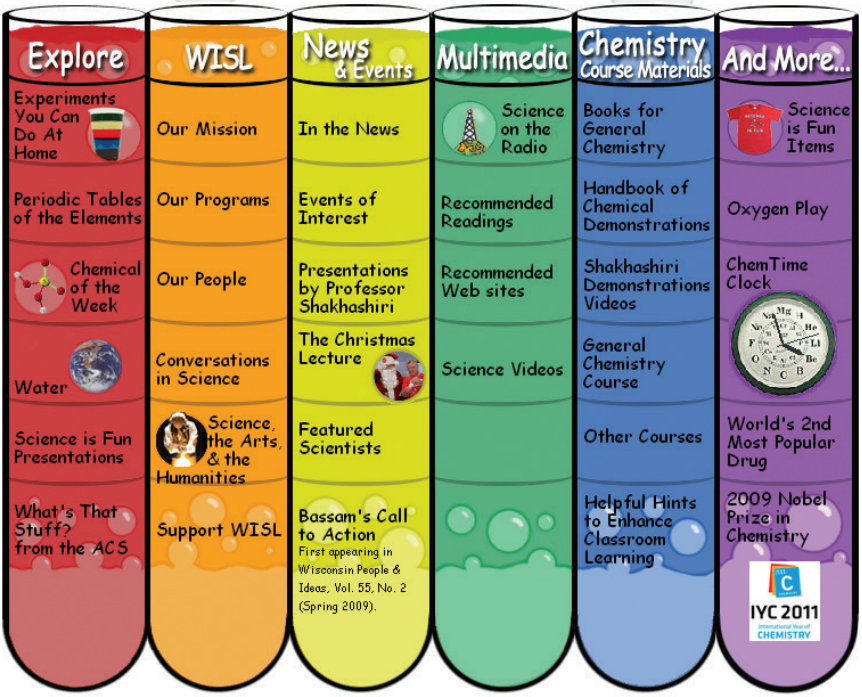
Your gift is greatly appreciated.

SCIENCE IS FUN

in the Lab of Shakhashiri

The master of chemical demonstrations and science policy advocate, University of Wisconsin-Madison Chemistry Professor Bassam Z. Shakhashiri, shares the fun of science through home science activities, public presentations, scholarship, and other programs of the Wisconsin Initiative for Science Literacy.

40 Years of Once Upon a Christmas Cheery, In the Lab of Shakhashiri ... And Beyond!



Wisconsin Public Television Telecasts:

Monday, Dec. 21, 1:00 p.m.

Thursday, Dec. 24, 1:30 p.m.

Monday, Dec. 28, 1:00 p.m.

Check local listings for telecast times elsewhere.

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