

CERAMIC AND GLASS INDUSTRY FOUNDATION

2016 Annual Report

What's inside:

2016 Financial Summary

Corporate Gifts

Program Updates

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Message from the Board of Trustees Chair, Ted Day



Over the past two years, The Ceramic and Glass Industry Foundation has made great progress! With your help in 2016, we expanded our programs and were able to inspire more students to consider careers in the ceramic and glass fields. Thank you for all that you do to help advance our goal of attracting and training the next generation of ceramic and glass professionals. Without your help, none of this would be possible!

Ted Day
Chair, The Ceramic and Glass Industry Foundation

Let's Stay Connected!

The CGIF wants to make sure we have your current email address so that we can send you important news, recent funding developments, or other updates.

If you have a new email address, simply email Foundation@ceramics.org. In the subject line, type "Update Email" and we will make sure that we have your latest email address in our system. It's important to stay connected!

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Corporate Gifts

The Ceramic and Glass Industry Foundation is extremely grateful for the corporations and corporate foundations who so generously provided gifts.

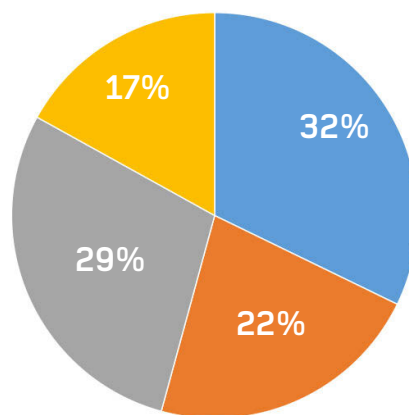
The Foundation is extremely honored to be the recipient of a \$100,000 endowment from **Dr. Shunpei Yamazaki**, the founder and president of **Semiconductor Energy Laboratory, Co., Ltd (SEL)** in Japan, and CGIF Board of Trustees member. Starting in 2017, the endowment fund, known as the SEL Travel Grant Fund, will be used to support travel grants for students to attend Society and Foundation-sponsored meetings and programs. When possible, a significant portion of the funds will be used to facilitate exchanges of Japanese students to meetings and programs outside of Japan or for students from other countries to attend meetings and programs in Japan.

The **Corning Incorporated Foundation** provided a grant of \$50,000 to support the CGIF's student outreach programs to increase awareness of ceramic and glass materials science among middle school and high school students in the United States. This grant and partnership with the Corning Incorporated Foundation will allow the CGIF to introduce young people to the world of ceramic and glass materials through the distribution of the CGIF's Materials Science Classroom Kits in 2017. The CGIF will focus its outreach efforts on the middle schools and high schools located in the areas of the United States where Corning Incorporated operates, which includes approximately 165 middle schools and high schools in 17 target communities. The primary objective is to get the kits and books into the hands of educators who are excited to teach materials science to their students.

The CGIF and The Glass Manufacturing Industry Council (GMIC), jointly received a \$20,000 grant from the **Owens-Illinois Charities Foundation** to support CGIF outreach programs and provide travel grants to college-age students. The CGIF used \$10,000 of the grant to support the Foundation's programs, which introduce middle school and high school students to ceramic and glass science. The remaining \$10,000 was used to fund travel grants that allowed 20 college-age students to attend the 77th Conference on Glass Problems in November 2016.

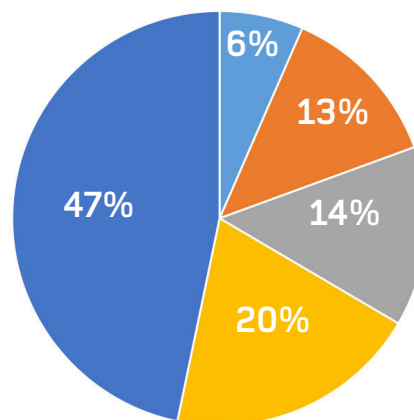
2016 Program Expenses

Student Exchanges and Travel Grants	\$ 38,000
Student Leadership Development	\$ 26,000
Student Outreach	\$ 34,000
University-Industry Network	\$ 20,000
Total Program Expenses	\$118,000



2016 Funding Sources

Program Revenue	\$ 34,000
Individuals	\$ 67,000
Foundations	\$ 73,000
Corporations	\$ 103,000
ACerS Matching Gifts	\$ 243,000
Total Funding	\$520,000



2016 Programs Summary

Materials Science Classroom Kit and *The Magic of Ceramics*

The CGIF's student outreach efforts were greatly enhanced by the launch of the exciting re-designed Materials Science Classroom Kit, our outstanding tool that facilitates learning and inspires students to pursue further studies in materials science. Fun, hands-on lessons and activities introduce middle and high school students to the basic classes of materials — ceramics, composites, metals, and polymers.

Utilizing feedback from teachers and other users, we selected the best demonstrations and labs from the original teacher and student kits, developed several years ago by students in the President's Council of Student Advisors (PCSA), for inclusion into one convenient Materials Science Classroom Kit.

We added the book, *The Magic of Ceramics*, by ACerS member Dr. David Richerson, as a component of the kit, which has proven to be widely popular. The kit redesign also included an updated Teachers Manual, as well as an expanded introductory PowerPoint presentation. Instructional videos were written and produced for each lesson in the kit (nine in total), which are included on a flash drive in the kit and are available online.

"I think that including the videos is a great idea- when I'm doing demos for my students that are new to me, it's always nice to see how they are supposed to work! And the kit in general is a great resource; the practical application is really what helps make the material so relatable for the students. Thanks again for all of your support of teachers!"

*Kate Broerman
Centerville (Ohio) High School*

As an accompaniment to the Materials Science Classroom Kit, all of the revised and updated lessons that are included in the new kit are available as free downloads on the ACerS website. There are also three lessons available for those teachers who have access to liquid nitrogen, and members of the PCSA wrote three additional lessons on ceramics concepts that can be downloaded: The Building Blocks of Ceramics, Sintering: Grain Boundaries, Interfaces, and Porosity, and Slip Casting.

The new kit is now a high-quality resource for teachers. It was extremely well-received following its launch, which resulted in a 73% increase in

distribution in the fourth quarter of 2016 compared to the fourth quarter of 2015, which means that more and more students are learning about ceramic and glass science than before!



A teacher from Chicago Public Schools reviews the new kit for her classroom.

Student and Educator Outreach

In spring 2016, the CGIF was a popular exhibitor at the **2016 USA Science & Engineering Festival** in Washington, DC. This festival is the country's only national science festival, developed to increase awareness about the importance of science and to encourage youth to pursue careers in science and engineering. The CGIF presented hands-on ceramic and glass materials demonstrations for the 360,000 students, teachers, and parents in attendance. We introduced teachers to our Materials Science Kits for Teachers and encouraged them to provide contact information if they were interested in receiving a kit for their classroom. Later in the year, kits were provided to many of those teachers through the generous support of the ACerS Refractory Ceramics Division.

"I'd like to thank you on behalf of my school and students. It was a great event for all of us!"
*Cetin Akkaya, Science Teacher/STEM
Coordinator
Beehive Science and Technology Academy*

The Ceramic and Glass Industry Foundation came away an award winner following its participation in the **Technology and Engineering Showcase at the 2016 Ohio State Fair!** The annual exhibition is sponsored by the Ohio Technology & Engineering Educators Association, which awarded the Foundation the 2016 Best Technology Exhibit and an Outstanding Award for Technology Education. The CGIF chose this venue to provide unique learning

experiences to those who may be unfamiliar with ceramic and glass science. Both children and adults were engrossed in the unique demonstrations provided at our exhibit. Students from The Ohio State University's Materials Science and Engineering Department assisted in demonstrating various activities for interested fairgoers.



OSU student Derek Miller demonstrates the properties of a material at the Ohio State Fair.

Students and teachers attending the **Mini-Materials Camp held during MS&T 2016** in Salt Lake City, Utah, in October received first-hand knowledge of several of the demonstrations included in the Materials Science Classroom Kit. The teachers and more than 245 students were able to take part in the labs and experiments performed by members of the ACerS President's Council of Student Advisors and volunteers representing the ACerS Refractory Ceramics Division.

Additionally, the CGIF added two important conferences to its outreach schedule. **The Materials in STEM (M-STEM)** conference took place in Tulsa, Oklahoma, in November, and allowed high school teachers to perform hands-on demonstrations from our Materials Science Classroom Kit. The **National Science Teachers Association (NSTA) Area Conference** was held in Columbus, Ohio, in December and was an excellent venue for the promotion of our Materials Science Classroom Kit to science teachers from around the region. It is estimated that more than 2,400 science teachers attended the three-day conference.

Student Exchange Programs

Student exchanges are becoming an important part of the Foundation's outreach efforts! In January 2016, ACerS and the CGIF hosted the first Winter Workshop at the University of Central Florida. Forty students and young professionals from around the world attended the workshop, which focused on a combination of technical and professional development sessions. The program involved participation from the European Ceramic Society (ECerS), which provided travel grants for international students to attend our Winter Workshop.

The CGIF is committed to encouraging the cross-cultural sharing of knowledge, ideas, and perspectives. As such, we provided travel support to 13 students from the United States, Indonesia, Thailand, India, and Pakistan to attend the ECerS Summer School in Limoges, France, in June 2016.

"I cannot express enough my sincere gratitude to ACerS for the travel support, as otherwise this fantastic experience would not have been possible for me. I learned a great deal of extremely relevant electroceramics expertise for my upcoming research work, as well as had a beneficial experience interacting with my peers and learning from their diverse scientific and intercultural insight."

Will Huddleston

Case Western Reserve University



Several of the CGIF-supported students enjoying Limoges, France.

Student Leadership Development

The CGIF is pleased to now directly support the **President's Council of Student Advisors (PCSA)** by offering university students opportunities to learn and grow as young leaders. The PCSA is a student-led committee whose mission is to engage students as active and long-term leaders in the ceramics community and to increase participation in ACerS at

the local, national, and international levels.

PCSA delegates represent their collegiate institution, while representing the PCSA and ACerS to their Material Advantage Chapter, Keramos Chapter, and academic department. The PCSA currently consists of 50 students from 35 universities, representing 10 countries.



2016-17 PCSA Delegates with then-president Mrytyunjay Singh.

PCSA members coordinate student-focused ceramic programming at technical meetings, facilitate industry-student relations via plant tours, and volunteer at outreach events to share their passion with younger students. The PCSA members also created the lesson plans and designed the original version of the materials science kits.

The CGIF consistently seeks to develop more opportunities for students to learn about careers in the ceramic and glass industry. To that end, we were pleased to host a **Ceramic Careers Mentoring Luncheon** at MS&T in October 2016. Student attendees were enthralled with the career wisdom provided by industry experts Ted Day (Mo-Sci Corporation), Kathleen Richardson (University of Central Florida), Richard Feeser (Superior Technical Ceramics), and Valerie Wiesner (NASA Glenn Research Center). The panel of professionals from the ceramics and glass industry presented a brief overview of jobs in their fields and were available for one-on-one career questions and advice.

The CGIF continued its productive partnership with the schools of the **University-Industry Network**, a global program designed to encourage colleges and universities to continue teaching specialized concepts of ceramic and glass science. The five schools that were chosen to pilot the program are: Alfred University, Clemson University, The Colorado School of Mines, Penn State, and Missouri University of Science and Technology.

The network continues to focus on undergraduate

students and provides financial and programmatic resources to key professors who facilitate opportunities for students to develop an interest in the ceramic and glass fields. In addition, the program helps connect students with champions in industry who utilize ceramic and glass materials.

"I enjoyed the range of perspectives that were in the room and the networking connections I was able to make. I enjoyed the experience, the lunch was good, the advice was good, and it has led me to join the ACerS community."

*John Robert Salasin
PhD Student*



Dr. Kathleen Richardson discusses career choices with students.

Students at Clemson, for example, were able to significantly improve a new lab in their junior lab course. The lab focuses on the Weibull analysis of fracture of glass and the effect of surface treatment (both sanding and ion exchange) on the strength and strength distribution. The CGIF support was used to acquire the materials and supplies for this lab, thus significantly increasing the number of samples that were tested giving a reliable strength distribution. In addition, the enhanced lab ensured that all students were able to participate in the lab.

The Foundation's **Ceramic and Glass Career Center** website continues to be the ideal place for job and internship seekers to find their next ceramic and glass career opportunity. Additionally, employers know that they can find the most knowledgeable candidates on the site, as evidenced by the hundreds of jobs posted in 2016! The CGIF promotes the site to all ACerS members, especially our students and young professionals. Our site is the premier resource used by those seeking to start or further a career in the ceramic and glass industry, including engineers, technicians, recent university graduates, and post-doctoral researchers.

The Ceramic and Glass Industry Foundation and The American Ceramic Society gratefully acknowledge all who made donations in 2016! We are thankful that your generosity enables us to make a difference in the lives of others and to attract, inspire, and train the next generation of ceramic and glass professionals.

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Remember that every dollar you donate to the CGIF will be doubled by the ACerS \$1,000,000 matching grant! For more information on making a gift to the Foundation, go to foundation.ceramics.org/give

Mission of The Ceramic and Glass Industry Foundation

The mission of the CGIF is to ensure that the industry is able to attract and train the highest quality talent available to work with engineered systems and products that utilize ceramic and glass materials.

Your gift can help introduce more young people to ceramic and glass science! Please join us in our mission of attracting, inspiring, and training the next generation of ceramic and glass professionals.

Every dollar that you donate will be doubled by the ACerS \$1,000,000 matching grant!

- Donate a Materials Science Classroom Kit for only \$250 to a school near you
 - Consider a Legacy gift to the Foundation
 - Let us know if your company has a gift matching program
 - We can assist with Donor Advised Fund gifts
-

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