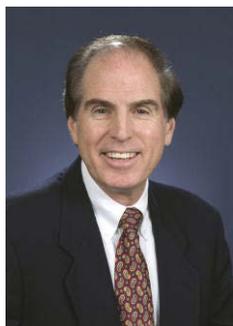




SUMMER 2012 NEWSLETTER



Leonard Brillson
Editor, INTERSECTIONS
Member, Government Affairs Committee

Welcome to our Summer 2012 Newsletter! As Congress moves forward with its legislative budget process, the Presidential and Congressional campaigns, the search for consensus in finalizing appropriations bills, and the looming threat of budget cuts mandated by sequestration are all factors influencing its ultimate support for science and technology. The decisions that Congress makes over the next few months could have a dramatic impact on the scientific community. The MRS Government Affairs Committee aims to understand the changing policy environment and its impact on materials research. This quarter the Committee continued to monitor changes affecting R&D policies, coordinated an online letter-writing campaign in support of National Science Foundation appropriations, and prepared the new crop of Congressional Science and Engineering Fellows for their work on Capitol Hill this fall. Please welcome our new Grassroots Chair, Tabbetha Dobbins, who has already initiated an effort to broaden the participation of MRS members as grassroots volunteers. This issue also provides an overview of President Obama's Materials Genome Initiative, which offers major funding opportunities for materials researchers. A new *INTERSECTIONS* feature appears this month – stories on value-added materials science. These stories are intended to highlight research that illustrates how investments in materials science pay off in ways that the general public and especially our elected officials can relate to. This will be a continuing series. MRS is working hard to make sure that the materials research community is being heard and that it has input in developing effective government policy for support of materials science. Here is the latest news.

WHAT'S HAPPENING IN WASHINGTON



Ronald L. Kelley
MRS Washington Consultant

Prior to the August break, Congress continued work on many bills that have a direct impact on the Materials Research Society. Your Government Affairs Committee advocates on behalf of scientific research appropriations particularly focused in three separate bills—dealing with 1) defense, 2) science, and 3) energy. As of July, the House of Representatives has passed each of these individual bills and is currently waiting on the Senate's final disposition. Two of the three parallel bills in the Senate have moved through the Appropriations Committee. However, none of the appropriations in the Senate have been acted upon on the Senate floor. This places a lot of burden on lawmakers to complete bills, if possible, when they return in September. However, the most likely scenario is that very few appropriations bills will be finalized prior to the election in early November. We are clearly facing one or more combined bills (omnibus) and a continuing resolution (CR) for funding after October 1 to keep the federal government operating near FY2012 levels. The CR will likely be passed for

more than a few weeks. The White House and Congress announced this week they are planning a CR for a full 6 months into the new fiscal year. Research funding faces another challenge in the final months of 2012. The mandated cuts from sequestration on January 1, 2013 could negatively impact the FY2013 funding further by as much as 7-10%. Both defense and non-defense funding will be included unless there is some resolution for sequestration that is offered in the fourth quarter of this year. Many dramatic outcomes could be the result of this reduction in funding, and most lobbying advocacy organizations are working to minimize the chance of this happening. But it is still a very real possibility. The two political parties are offering solutions, but they do not seem to have any buy-in from the opposing side. Each day that we move closer to Congress trying to decide all of the large issues after the election, the more stressed the environment will be for finding realistic solutions. In addition to the FY2013 final appropriations and the impact of automatic (sequestration) reductions, Congress must address, post-election, the Bush tax cuts expiration, debt ceiling limits, estate taxes, and other major pieces of legislation that are expiring.

In addition to the issues outlined above, we are also working to highlight legislation that has resulted from our policy study with APS Physics on energy critical elements. There are two bills which are currently being considered for mark up in the Senate Energy and Natural Resources Committee. One bill is

focused on helium stewardship and another bill addresses critical minerals and materials. MRS is working in active coalitions with other organizations and institutions to highlight the benefit of these bills and to encourage their passage. If anyone would like additional information on the details on any topics covered, please drop us a note at publicaffairs@mrs.org, and we will be glad to follow up with you. We hope that a majority of our readers will write your Members (Representative and Senators) of Congress expressing a desire to see sustained and predictable appropriations for the coming year. MRS makes this letter writing process very simple and straight forward so you can express your own views. Visit www.mrs.org/materials-voice today.

GREETINGS FROM THE NEW GOVERNMENT AFFAIRS COMMITTEE GRASSROOTS CHAIR



*Tabbetha Dobbins
Chair, Grassroots Subcommittee*

Greetings, MRS Membership! I hope that the summer finds you well. As the new Grassroots Subcommittee chairperson, I am delighted to work with you to bring our concerns to the attention of our representatives in Washington, D.C. The subcommittee has been working hard on several fronts. We prepared a Public Affairs Alert (issued in July 2012) aimed at support for the National Science Foundation (NSF) appropriations for FY 2013. Please take time to log in to www.mrs.org/advocacy-issues and send this letter to your House and Senate offices. It takes fewer than 5 minutes to engage in this important civic duty. As a new initiative, the subcommittee will publicize informative articles from our *INTERSECTIONS* Newsletter via social media (i.e. Facebook and Twitter). We hope that you “Like” or “Retweet” these items to help us to broaden participation on grassroots volunteerism. Also, we are working to increase student participation at the Materials Voice kiosk during the MRS Fall and Spring Meetings beginning with a survey of prior volunteers to capture reflections on their experiences. I look forward to an exciting year as the subcommittee chair.

MRS CONGRESSIONAL SCIENCE AND ENGINEERING FELLOWSHIP CORNER



*Kevin Whittlesey
Chair, Fellowship Subcommittee*

With the 2012-2013 Congressional Fellows selected, the summer has seen the Congressional Fellowship Subcommittee focus its attention to preparing for the fall. September will mark not only the arrival of our 2012-2013 Congressional Fellows in

Washington, D.C., but also the beginning of the application process for the 2013-2014 Fellowship.

In September MRS will welcome our 2012-2013 Fellows to the program with a kick-off breakfast with former Fellows as well as invited GAC members and other MRS leadership. This will be held before the Fellows begin their orientation program and provide our incoming Fellows with the opportunity to meet some of their MRS colleagues. In the past this has also been a useful forum for the incoming Fellows to learn from the experiences of others to help them prepare for the year ahead.

Another important ongoing activity is a review of the outreach and communication efforts to promote the Congressional Fellowship Program. In preparation for the next application cycle, GAC and other MRS staff are in the process of developing updated outreach materials for the Congressional Fellowship program. In the coming months, expect to see updates to the website that will include testimonials by, and video interviews with, former Fellows. Also look for revised bios and info regarding our incoming Fellows as well as updates from our 2011-2012 Fellows for their career plans after the conclusion of their Fellowship terms. Highlighting the wonderful careers that our Fellows go on to have is a great demonstration of the value of this experience that will not only be a useful recruiting tool to attract future applicants, but also show the broader MRS membership the impact that the program has. Along similar lines, a number of outreach efforts are currently being planned to highlight the Congressional Fellowship program at the 2012 MRS Fall Meeting, so stay tuned for details!

MATERIALS GENOME INITIATIVE



*Ashley White
AAAS 2011-2013 Science &
Technology Policy Fellow, National
Science Foundation*

Last year President Obama launched the Materials Genome Initiative (MGI), which aims to cut in half the current time and cost of bringing new materials from the laboratory to the marketplace. The administration plans to achieve this goal by investing in research that closely integrates experimental tools, computational tools, and digital data through more collaborative and iterative approaches to materials development.

Several government agencies are working to advance the initiative, coordinated by an interagency subcommittee chaired by Dr. Cyrus Wadia, assistant director for Clean Energy and Materials Research and Development at the White House Office of Science and Technology Policy. In FY 2012 the Department of Defense (DoD), the Department of Energy (DOE), the National Science Foundation (NSF), and the National Institute of Standards and Technology (NIST)

together invested \$60 million and have requested significant budget increases for FY 2013 to continue to build the program.

MGI's success will depend on the support and active participation of government, academia, and industry. In May more than 60 companies and universities announced commitments to MGI, joining a list of support from industry, academia, national laboratories, and professional societies. For more information about MGI, please see MRS President Bruce Clemens' letter of support and the accompanying article in the August 2012 issue of the *MRS Bulletin*. Further details can be found on the White House blog by searching for "materials genome initiative" at www.whitehouse.gov/blog. Any opinion, finding, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

A VALUE-ADDED MATERIALS RESEARCH STORY: LEAD-FREE SOLDER



*Iver Anderson
Senior Metallurgist*

Computers, smartphones, and electronic tablets—they're ubiquitous in today's society and many of them have one thing in common—the use of lead-free solder. Ames Laboratory's most successful invention to date has been the design of a tin-silver-copper alloy to replace traditional lead-based solder, providing an environmentally-friendly replacement material. Licensed by more than 50 companies worldwide, Ames Laboratory's lead-free solder has generated nearly \$39M in royalties based on over \$2.5B in sales worldwide since it was patented in 1996. Developed by a team of researchers led by Ames Laboratory's senior metallurgist Iver Anderson, lead-free solder was a necessary development to help eliminate toxic lead from landfills caused by the disposal of an ever-growing amount of

electronic waste. Solder is the shiny metal "glue" used to attach components to circuit boards in all types of electronics from cellphones and computers to televisions and kitchen appliances. "Solder has been around for 5,000 years and the basic formula of 63 percent tin and 37 percent lead was unchanged," Anderson says. "It was used because it is a eutectic alloy – it acts like a pure metal with a single melting (and solidification) point." This eutectic property made finding a non-lead substitute difficult. Anderson's team experimented with various combinations until they found a mixture of tin, silver and copper that offered a lower melting point and greater strength than other alloys being considered.

The driving force behind a lead-free alternative to traditional solder was a ban on the use of lead and other hazardous materials in all electronics that was imposed by the European Union (EU) in 2006. Given the global nature of electronics manufacturing and distribution, the EU's ban was international in scope. Tests show the Ames Lab solder exhibits higher strength than the original lead-based predecessor. Its 217° C melting point makes it a viable choice for the increasing number of electronic components in automotive applications. Temperatures there can easily reach 150° C, causing typical lead solder, with a 183° C melting point, to become pliant and subject to failure. In general, when it comes to successfully moving inventions from the laboratory bench to the commercial marketplace, Ames Laboratory has an excellent track record. But, of all of the many Ames Laboratory's patents licensed and developed commercially since record keeping began in 1980, few have had a bigger societal impact or been more financially successful than lead-free solder.

(Story line by Kerry Gibson, Public Affairs, Ames Laboratory).



FEEDBACK

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