2019/2020 Division & Class Report
to the
ACerS Board of Directors

Division/Class: Electronics Division

Current Division/Class Officers: (complete as appropriate for your Division or Class)

Chair: Jon Ihlefeld
Chair-Elect: Alp Sehirlioglu
Vice-chair: Claire Xiong
Secretary: Jennifer Andrew
Secretary-Elect: Ed Gorzkowski
Trustee: Steven Tidrow
Board of Directors Liaison: Helen Chan
PCSA Representative: Michael Thuis; Guoyang Ye

Incoming Division Officers: (complete as appropriate for your Division or Class)

Note: most Divisions change officers at the ACerS Annual Meeting in October (MS&T). If your Division changes officers at another time, please indicate when incoming officers will begin their terms: _____

Chair: Alp Sehirlioglu
Chair-Elect: Claire Xiong
Vice-chair: Jennifer Andrew
Secretary: Ed Gorzkowski
Secretary-Elect: Matjaz Spreitzer
Trustee: Steven Tidrow

Summary of Meetings and Activities Held/To Be Held (from Oct. 2019 through Oct. 2020):

1) EDiv Executive Committee Meeting, Portland, OR, Sept. 28, 2019
2) EDiv General Business Meeting, Portland, OR, Sept. 29, 2019
3) EDiv Executive Committee Meeting, Orlando, FL, Jan. 24, 2020
4) EDiv Executive Committee Meeting, Virtual, April 30, 2020
5) EDiv Executive Committee Meeting, Virtual, August 19, 2020
6) EDiv Executive Committee Meeting, Virtual, October 4, 2020
7) EDiv General Business Meeting, Virtual, October 5, 2020

Future Planned Meetings/Activities (from Nov. 2020 – October 2021):

1) EDiv Executive Committee Meeting, Virtual, Aligned with EMA in January 2021

New Initiatives/Opportunities:
The Division is exploring means to leverage the virtual conference environment to reach participants that typically cannot attend and contribute to ACerS meetings. We plan to utilize Division funds to support the registration fees and 1 year of GGRN membership for graduate students to attend the EMA meeting in January. Students will be targeted from groups that are traditionally under-represented in our meetings. These include students from Historically Black Colleges and Universities in the US, Puerto Rican Universities, South American Universities, and possibly African Universities. We are working with the Office of Naval Research to help identify points of contact at HBCUs and Puerto Rico to help in student recruiting and will work with existing contacts in South America to advertise this opportunity. It is anticipated that ~100 students can be supported in this effort. In the longer term, the Division is seeking to develop virtual workshops for students from disadvantaged backgrounds to provide instruction and realization of opportunities in electronic materials.

The Division has had discussions with an industrial consortium group, the International Electronics Manufacturing Initiative (iNEMI), about leveraging our Divisions' programming in materials for 5G to increase industrial participation. Initial ideas are to consider having a joint program between iNEMI and the Materials for 5G symposium at future EMA meetings. This will benefit ACerS by bringing new electronic materials participants from an industrial population that has, at least recently, been relatively inactive in division activities. iNEMI participants will benefit from access to academic research and students that attend and present at EMA that can serve as future employees in their companies. Discussions are ongoing.

EDiv is seeking to formalize a committee that has been operating informally for several years: Committee on Webpage/Marketing. We plan to vote on the formal addition of a Committee on Outreach at the Division's Business meeting in 2020. This committee manages the Division's social media accounts (currently an Instagram account and the Division's webpage at ceramics.org) and will work to coordinate Division outreach activities. The Committee's description for the Division's Rules has been approved by the Society Parliamentarian.

EDiv sought to reconnect with Materials Advantage chapters that had previously received a Materials Education Kit courtesy of the Division. Our plan was to seek photos of the kits in use and to post these on the Division's Instagram showing our outreach efforts. Unfortunately, the COVID-19 Pandemic made it impossible for MA chapters to use the kits in schools and this plan was put on hold.

EDiv also sought to launch a plan to get industrial members to visit Materials Advantage chapters and present on their work in industry as a way to energize young engineers to consider a career in electronic ceramics. The plan was to provide Division funds to the industrial member to purchase refreshments for the students, but this plan was impacted by the COVID-19 pandemic and put on hold.

Action Items for ACerS Board Consideration at October 2, 2020 virtual meeting:

N/A

Issues/Concerns:

Membership continues to decrease for the Division. The current membership is 758, which is down from 806 in 2019 and 810 in 2018. The historic high was in 919 in 2015 and had leveled off in the low 800s for several years. This sudden decrease is occurring in spite of the Division's focus on student participation and young professional membership in our committees and Division Executive leadership. Further, the Society's allowance of each member to join 3 Divisions has not resulted in an increase in our membership, which is surprising. We find that there are many ACerS members that work in the electronic ceramics space and attend the EMA meeting that are not members of the Division. Many are BSD members (which co-organizes EMA, so that in itself is not alarming) and the new Energy Division, but not EDiv. Many in the executive leadership of EDiv in 2018-2019 were concerned about the new Energy Division's significant topical overlap with EDiv and these concerns appear to be real. We must note that most divisions experienced decreased membership this year and ACerS as a whole is down ~5%, so the 6% drop is consistent with the whole society. More concerning is the lack of increase in membership when the three Division affiliation policy was enacted.

The success of our Division's EMA meeting in mid-January and its proximity to the Annual Meeting, typically held in early/mid-October impacts our footprint at the Annual Meeting. This is further challenged by a high fraction of the Division members being active within IEEE and attending the IEEE ISAF meeting every year, which is typically held in summer (variable between May and August). The end result is limited programming and attendance at the Annual Meeting – the membership gets spread thin. It is not clear how to rectify this – we have sought to have differentiating programming at the Annual Meeting, but that also divides our membership because EDiv members that work in the spaces covered at the Annual Meeting may not interact with the members that attend EMA. As a Division, we are concerned that this also impacts the visibility of our members within ACerS as a whole. By not having a large Annual Meeting footprint, our members may not be afforded the same opportunities for Society Committee and Leadership positions, as well as awards, simply due to the lack of name recognition and face time with the rest of the Society membership. We do have robust Annual Meeting programs this year and next year and it will remain to be seen how this will impact attendance at EMA.

Additional Items of Note:
2020 marks the 100th anniversary of the discovery of ferroelectricity – an important electronic phenomenon that occurs in a special class of ceramic materials. The Division worked with Eileen De Guire to commemorate this milestone with members authoring two articles in the January issue of the Bulletin.

Committee Reports:

Committee on Meetings:
The Committee on Meetings was chaired by Claire Xiong (Boise State University). Summaries of our activities at the Annual Meeting and our Division Meeting (EMA) are provided below:

MS&T Symposia

The Division significantly increased our Annual Meeting programming. In 2019 we had just 1 EDiv-led symposium. In 2020, we have 9 symposia with EDiv organizers (6 solely sponsored by EDiv members) including 2 new symposia and they are listed below:

1) Machine Learning for Discovery of Structure-Process-Property Relations in Electronic Materials (NEW), organized by B. Reeja Jayan (Carnegie Mellon University)
2) Advanced Materials for Harsh Environments organized by Navin Manjooran (Solve Technology and Research, Inc.)
3) Advances in Dielectric Materials and Electronic Devices organized by Amar Bhalla (University of Texas – San Antonio)
4) Synthesis, Characterization, Modeling and Applications of Functional Porous Materials organized by Lan Li (Boise State University)
5) Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry organized by Gary Pickrell (Virginia Tech)
6) Functional Defects in Electroceramic Materials (NEW) organized by Claire Xiong (Boise State University)
7) Phase Transformations in Ceramics: Science and Applications organized by organized by Waltraud Kriven (University of Illinois at Urbana-Champaign)
8) Materials Informatics for Images and Multi-Dimensional Datasets organized by Amanda Krause (University of Florida)
9) Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials organized by Haitao Zhang (University of North Carolina at Charlotte)

At MS&T 2021, there will be 8 symposia organized EDiv with the symposium on Advanced Materials for Harsh Environments discontinued.

EMA 2020

The meeting chairs of EMA 2020 were Alp Sehirlioglu (EDiv), Claire Xiong (EDiv), Wolfgang Rheinheimer (BSD) and Jeff Rickman (BSD). There were 16 symposia of which 3 were new compared to previous year. Plenary speakers were Guus Rijnders (University of Twente, Netherlands) and Elizabeth Dickey (North Carolina State University, USA).

There were 338 submitted/accepted abstracts, but COVID-19 and the meeting time overlapping with the Chinese New Year might have affected the actual attendance (274). For historical reference, the 2019 and 2018 meetings had 348 and 351 abstracts submitted, respectively. Sponsorship included ACS Applied Electronic Materials ($1K), 3M ($1K), and Radiant Technologies ($2K). The meeting featured student and young professional centered activities as a tradition, which included two lunch workshops, a student and young professional reception, ‘Lunch with a Pro’ organized by the YPN, student poster session, and student oral presentation competition that was judged throughout the meeting. Also, as a tradition, the grand finale of the meeting was the popular “Failure: The Greatest Teacher” where established researchers discuss the great ideas that they’ve had that did not work out for one reason or another. The lunch sessions included one on methods to improve the impact of publications and one on the history of ferroelectricity, presented by Susan Trolier-McKinstry (Penn State University) to celebrate the 100th anniversary of the discovery ferroelectricity. The top three student talk and poster awards were given at the banquet. Three tutorials were given. Two were part of BSD’s programming at the conference: Advanced Electron Microscopy given by Shen Dillon (UIUC) and David McComb (the Ohio State University). One EDiv-led tutorial was geared toward industry participants was given by Nate Orloff at symposium 12 on Tutorial: How to measure permittivity on-wafer.

For 2021, there will be 15 symposia, most have similar topics with previous years. Due to COVID-19, it was decided that the meeting will be virtual. With reduced fees on registration it will be an opportunity for us to increase participation as described above in the New Initiatives/Opportunities section.

Awards Committee:
The Awards Committee was chaired by Ed Gorzkowski (U.S. Naval Research Laboratory).

Four Division members were elevated to Fellow in 2020: Scott Barnett (Northwestern University), Jon-Paul Maria (Penn State University), Xiaoli Tan (Iowa State University), and Rick Ubic (Boise State University).

Kevin Talley (Colorado School of Mines) was awarded the Morgan Medal and the Global Distinguished Doctoral Dissertation Award.

Long-Qing Chen (Penn State University), Fei Li (Xi'an Jiaotong University), and Shujun Zhang (University of Wollongong) received the Purdy Award.

Shashank Priya (Penn State University), Ed Gorzkowski (U.S. Naval Research Laboratory), and Tomoaki Yamada (Nagoya University) were bestowed Richard M. Fulrath Awards.

Scott Swartz (Nexceris) received the Medal for Leadership.

The Division's Henry Awardees were Ichiro Fujii, Saki Nakashima, and Takahiro Wada from University of Yamanashi and Ryokoku University for their paper entitled: "Fabrication of $_{0.24}Pb(In1/2Nb_{1/2})O_3$-$_{0.42}Pb(Mg1/3Nb_{2/3})O_3$-$_{0.34}PbTiO_3$ transparent ceramics by conventional sintering technique", Journal of the American Ceramic Society, 102(3), 1240-1248 (2019).

The Division's Lewis C. Hoffman Scholarship will be awarded to Eric Knowles from North Carolina State University.

For the Hoffman Scholarship Award, the selection procedure included rankings provided to each nominee by the 4-member Awards Committee followed by a discussion and selection. Seven students applied for the award.

For the Henry Award, the Committee Chair (Ed Gorzkowski) worked with two other members of the Awards Committee to read and select papers on the topic of Electronic ceramics published in The Journal in 2019 and utilized a committee meeting to select the recipient.

Rules Committee:
The Rules Committee, chaired by Rick Ubic (Boise State University), continued a several years' long effort to update Division Rules and Standard Operating Procedures. Rule modifications to be proposed for voting at the 2020 Division Business meeting include those with respect to succession of officers to better conform with practice.

Nominations Committee:
The Division's Nominations Committee, chaired by Rick Ubic, worked with Erica Zimmerman at ACerS to advertise a call for nominations for the new Secretary-Elect position. Two calls were sent out via email to Division members: October 2, 2019 and October 31, 2019. Candidates were asked to submit a CV, brief statement of interest, and any past volunteer service to EDiv or ACerS. Three nominations were collected and the successful candidate was Matjaz Spreitzer from the Josef Stefan Institute.

The committee also requested an email to be sent by ACerS to division members in February 2020 to advertise Society-wide volunteer opportunities in the Meetings, Member Services, and Publications and Nominating committees.

Fellows Committee:
The Fellows Committee, chaired by Geoff Brennecka, highlighted the elevation of 4 Division members to the level of ACerS Fellow.

Industrial Liaison Committee:
The Industrial Liaison Committee was chaired by Nate Orloff (NIST). Nate worked to connect the Division to iNEMI in an effort to build a community of ceramic scientists and engineers in the space of materials for 5G. A meeting was held between the Divisions' Executive Committee, Nate Orloff, Greg Geiger from ACerS, and Urmi Ray from iNEMI in May of 2020 to discuss opportunities for collaboration.

Webpage/Marketing Committee:
The Webpage/Marketing Committee is an unofficial committee chaired by Elizabeth Paisley (Sandia National Labs) and Christina Rost (James Madison University). Owing to the shutdown of universities due to the COVID-19 pandemic and the cancelation of graduation ceremonies, the Webpage/Marketing Committee solicited photos and brief biographies of graduating ceramics engineers and scientists to highlight on the Divisions' Instagram to help the students celebrate their accomplishments. Several students were highlighted. An effort by Elizabeth Paisley and Division Chair, Jon Ihlefeld, to make this an official committee was pursued and will be put to a vote at the Divisions 2020 Business Meeting.

Membership Committee:
The Membership Committee was chaired by Jennifer Andrew (University of Florida). The committee is working with the Division Executive Committee to leverage the online EMA to increase student participation and Division membership.

Financial Statement: (Including year-end summary of expenditures from the Division's Funds)

Submitted By: Jon Ihlefeld, Chair, Electronics Division, 2019-2020