



Special points of interest:

- Webinar October 21: Reusable Anti-Covid 19 Hydrophobic Face Masks
- Second Elmer Carvey 2020 Winner
- AVS 67 Virtual Showcase Conference Resources

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SCCAVS Webinar Series: Reusable Anti-Covid 19 Hydrophobic Face Masks, October 21, 7PM PDT

Contributed By Jeff Lince

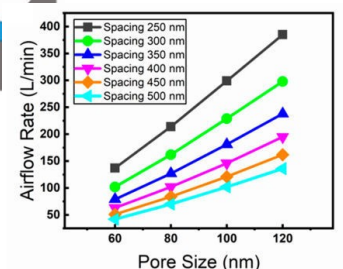
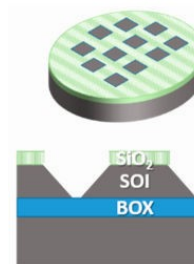
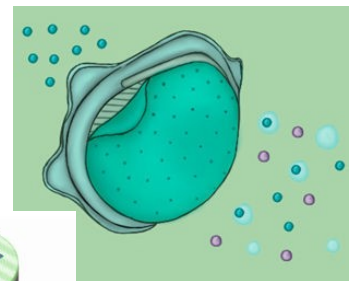
The Southern California Chapter of the AVS invites you to a lecture on a Flexible Nano-porous Template for the Design and Development of a Reusable Anti-COVID-19 Hydrophobic Face Mask. The lecture will be held as a webinar via ZOOM on October 21, 2020, at 7 pm PDT.

The presentation will be given by Professor Muhammad Mustafa Hussain of the King Abdullah University of Science & Technology and the University of California, Berkeley.

Since the outbreak of the severe respiratory disease caused by the novel coronavirus (COVID-19), the use of face masks has become ubiquitous worldwide to control the rapid spread of this pandemic. As a result, the world is currently facing a face mask shortage, where some countries placed a limit on the number of masks that can be bought by each person. On the other hand, while the surgical grade N95 mask provides the highest level of protection up till now, its filtration efficiency for sub-300-nm particles is around 85% due to its wider pore size (~300 nm). Since the COVID-19 virus shows a diameter of around 65–125 nm, there is a need for developing more efficient masks.

To overcome these issues, Professor Hussain's team recently demonstrated a flexible nano-porous membrane to achieve a reusable N95

mask with a replaceable membrane and enhanced filtration efficiency. A flexible nano-porous Si-based template was first developed on a silicon-on-insulator wafer using KOH etching; the template was then used as a template mask during a reactive ion etching process to transfer the patterns onto a flexible and lightweight (< 0.12 g) polymeric membrane. Pores with sizes down to 5-nm were achieved with a narrow distribution. Theoretical calculations showed that airflow rates above 5-10 L/min are possible through the mask which confirms its breathability over a wide range of pore sizes, densities, membrane thicknesses and pressure drops. Finally, the membrane was made intrinsically hydrophobic which contributes to anti-fouling and self-cleaning as a result of droplets rolling and sliding on the inclined mask area.



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### SCCAVS Webinar Series Continues October 21st With Professor Hussain of UC Berkeley (Cont'd)

Dr. Muhammad Mustafa Hussain (PhD, ECE, UT Austin, Dec 2005) is a Professor of Electrical Engineering, KAUST (since Fall 2009) and an incoming Professor of EECS, UC Berkeley (from Spring 2021). He was Program Manager in SEMATECH (2008-2009) and Process Integration Lead for 22 nm node FinFET CMOS in Texas Instruments (2006-2008). His research is focused on futuristic electronics which has received support from DARPA, Boeing, Lockheed Martin, GSK-Novartis, Saudi ARAMCO and SABIC. He has authored 450+ research papers and patents. He is a Fellow of IEEE, American Physical Society and Institute of Physics (UK), a distinguished lecturer of IEEE Electron Devices Society, and an Editor of IEEE T-ED. His research has been extensively highlighted by international media (CNN, Fox News, MSNBC, BBC, Washington Post, WSJ, National Geographic, Forbes, IEEE Spectrum, Wired, etc.) including being featured by Scientific American as one of the top 10 world changing ideas in 2014. He has received 47 international awards including Best Innovation Award, CES 2020, Edison Award 2020, Texas Exes Outstanding Young Alumni Award 2015, IEEE R5 Outstanding Individual Achievement Award 2016, DOW Sustainability Challenge Award 2012, Applied Physics Letters Best Featured Articles 2015, 2019, 2020, etc.

Register for this FREE Webinar sponsored by the Southern California Chapter of AVS by clicking here:

[REGISTER for the ZOOM Webinar here](#)



**Professor Muhammad Mustafa Hussain is a Professor of Electrical Engineering, KAUST (since Fall 2009) and an incoming Professor of EECS, UC Berkeley (from Spring 2021).**



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**Upcoming Webinars**

October 21, 2020  
7pm PDT

***Flexible Nanoporous  
Template for the De-  
sign and Development  
of a Reusable Anti-  
Covid 19 Hydrophobic  
Face Mask***

By Professor Muham-  
mad Mustafa Hussain of  
UC Berkeley

November 3, 2020  
1pm-5pm EDT

***Characterization of  
Thin Film Systems for  
Flexible Applications***  
By Megan Cordill &  
Christian Mitterer



***2020 Elmer Carvey Winner***

The second winner of the 2020 Elmer Carvey Scholarship is Joshua Huang, a graduating senior from Glendora High School. He will be attending UCLA in the Fall.

Mr. Huang excelled academically during his high school career. He successfully completed many AP courses, including completing the two-year AP Capstone program, which prepares high school students for conducting university research. Mr. J. Liao – Mr. Huang's AP Physics teacher – found that among many high performing AP students, he stood out for his positive attitude, sincere curiosity, and determination to excel.

In addition to a demanding course schedule, Mr. Huang also took a leadership role in the school robotics club. Mr. Terry Wall – the school's Computer Programming and Robotics instructor – reported that he was the vice president of the robotics club and driving force behind their team's most successful year to date during the construction of the robot and competition in the Los Angeles regional competition. He was heavily involved in the design process and business portions of the effort.

Mr. Huang plans to attain his BS in Materials Engineering at UCLA. His long term plans are to attain a PhD with the goal of continuing Materials research.

Emilio Ocampo is the other recipient of the 2020 Elmer Carvey Scholarship, as reported in the Summer 2020 issue.

The Elmer Carvey Memorial Scholarship was established in honor of Elmer Carvey, an active member of the SCCAVS from 1964 until 1982. The Scholarship is awarded to undergraduate students attending public, four-year colleges in California who are planning careers in areas of interest to the society, which include vacuum-related technologies, surface and thin film science, nanotechnology, the understanding of materials properties, and the development of new materials. The stipend is \$1,500.00 for one year.

***For more information on this scholarship visit***  
<https://www.sccavs.org/CarveyScholarshipApplication.pdf>



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# AVS 67 Virtual Showcase

OCTOBER 27-29, 2020

[www.avs67.avs.org](http://www.avs67.avs.org)



With the unfortunate cancellation of the AVS 67th International Symposium & Exhibition, AVS is pleased to present the **AVS 67 Virtual Showcase** to be held **October 27-29, 2020, 10:00 am-1:15 pm. (EDT)**. Like the AVS International Symposium, this Virtual Showcase will also cover a range of emerging topics related to materials, processing, and interfaces in both the research and manufacturing communities. The Virtual Showcase will consist of three live sessions filled with invited speakers and award talks, live Q&A, other highlights, and special events.

Although you will be required to register to participate in this event, AVS is providing the Virtual Showcase **FREE of charge** in order to support our community, promote collaboration, networking, engagement, and disseminate scientific content.

**\*Live Daily Session with Invited Speakers and Award Presentations Featuring Live Q&A**

- [“It’s All in the Details: Mechanistic Understanding of Materials Fabrication and Analysis”](#)
- [“How Thin is Thin? Pushing the Limits of Nanoscale Interfacial Engineering”](#)
- [“The Future of the AVS: New Directions, Emergent Materials, and Their Applications”](#)

**\*Live Professional Development and Networking Events**

Join SCCAVS Chair Corinne D’Ambrosio for two events at AVS 67:

October 27th 1:30-2:30pm EDT [AVS 67 Kickoff After Party](#)

October 28th 1:30-2:30pm EDT [How to Make a Successful Career Transition](#)

**\*Live Virtual Sponsor Rooms**



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## October/November 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
11	12	13	14	15	16 ● <i>New Moon</i>	17
18	19	20	21 <i>Webinar 7pm PDT Anti-COVID Masks</i>	22	23	24
25	26	27	28	29	30	31 ○ <i>Full Moon</i>
<b>AVS 67 Virtual Showcase</b>						
1	2	3 <i>Webinar 1-5pm EDT Thin Film Systems</i>	4	5	6	7 
8	9	10	11	12	13	14 ● <i>New Moon</i>
15	16	17	18	19	20	21

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