

Joseph M. DeSimone, PhD

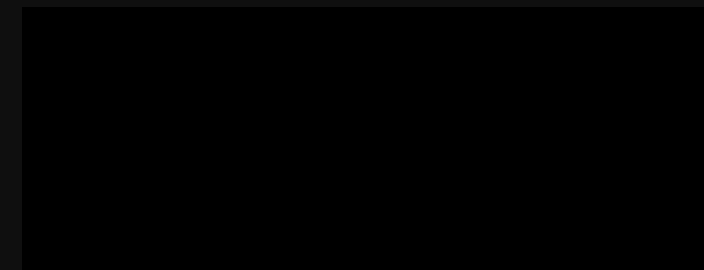
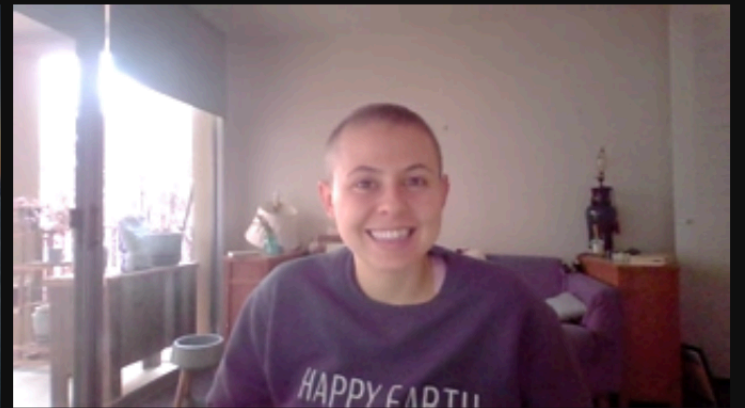
Department of Radiology, School of Medicine

Department of Chemical Engineering, School of Engineering

Stanford Graduate School of Business (by courtesy)

Stanford
University



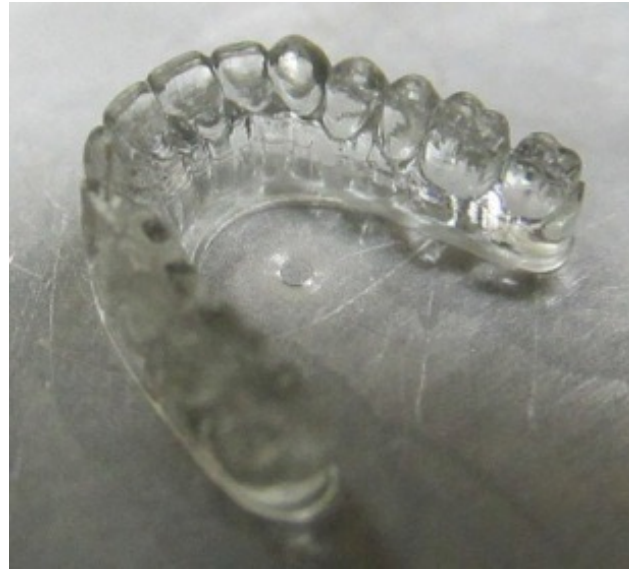
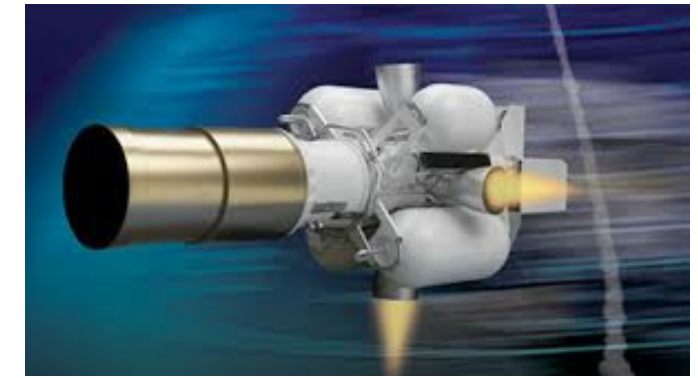


DeSimone Group Values

In this lab, we believe

- Science is real
- Love is love
- Black lives matter
- Women's rights are human rights
- Disabilities deserve accessibility
- Immigrants are welcome
- We need to leave the planet better than we found it
- Kindness is everything
- Every moment counts

Innovation Drives the Global Economy



“Research is an expression of faith in the possibility of progress. The drive that leads scholars to study a topic has to include the belief that new things can be discovered, that newer can be better, and that greater depth of understanding is achievable. Research, especially academic research, is a form of optimism about the human condition.”

Henry Rosovsky: The University: An Owners Manual

Clay Christensen's Innovator's Dilemma

Three kinds of innovations

- Disruptive
- Sustaining
- Efficiency

1. Disruptive Innovations

- Transforms things that are complex and expensive and makes them affordable and accessible.
- Creates millions of new jobs, but a 5-10 year return

2. Sustaining Innovations

- Replace old products with newer models. It makes products better. Important.
- Doesn't create new jobs.

3. Efficiency innovations

- Focused on streamlining and cost cutting, often through automation
- Provides a good return on investment in 12-18 months
- Reduces jobs

Convergence as a strategy to drive innovation

- National Academies study



Extend to social sciences, humanities and performing arts

- The coming together of different fields of study through collaboration and the integration of approaches that were originally viewed as distinct and potentially contradictory.
- "...convergence is a blueprint for innovation..."



Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond;
National Academies Press: Washington D.C., 2014. (Committee Chair)



“It’s in Apple’s DNA that technology alone is not enough. It’s technology married with liberal arts; married with the humanities; that yields us the result that makes our heart sing”

Steve Jobs

Culture of convergence

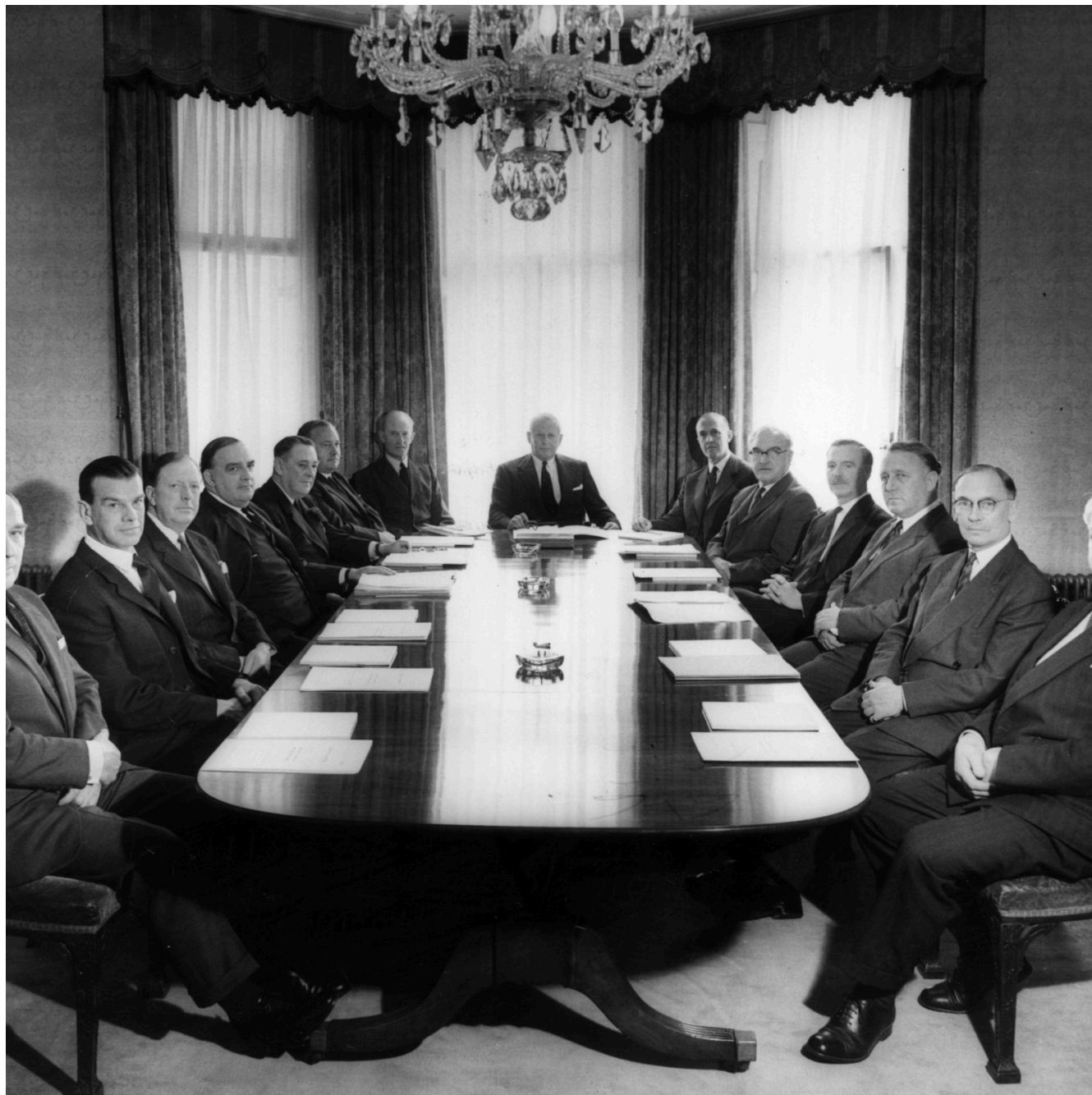
I, T, Π – individuals

Common Language vs Multi- Lingual

Vulnerable Trust

Impactful Moments in My Career

(1)



(2)

science/technology

"You can tell the chemist who synthesized the inhibitor how their compound is working inside a bacterial cell as distinct from a test tube where the enzyme is floating free," White says.

In addition, White says the method helps avoid jumping to incorrect conclusions about bacterial inhibition. Just because a compound inhibits an isolated enzyme and intact bacteria does not necessarily mean that the inhibition of that particular enzyme is restricting the bacterial growth. A single inhibitor can affect multiple enzymes.

There's no doubt that antibiotics have changed the medical landscape by reducing the threat of bacterial infections. "We've become very dependent on antibiotics," Davies says. "It's hard to see how one can continue to treat infectious diseases without antibiotics." The challenge is to prevent resistant bacteria from taking us back to the preantibiotic era. The ever-escalating arms race between bacteria and humans will continue indefinitely. As Davies says, "Resistant organisms are here to stay." ◀

Polymer workshop defers to NAACP boycott of South Carolina

The executive committee of the American Chemical Society's Division of Polymer Chemistry has relocated the division's fluoropolymer workshop from Charleston, S.C.—where it was scheduled to be held in October—to Savannah, Ga. The division's official announcement states: "In order to better serve the needs of our diverse membership, the [division] decided to move the Fluoropolymer 2000 workshop to Savannah, Ga., to be held Oct. 15–18."

The move is in response to a boycott against South Carolina imposed by the National Association for the Advancement of Colored People (NAACP) and brought to the division's attention by Joseph M. DeSimone, a professor of chemistry at the University of North Carolina, Chapel Hill, and a professor of chemical engineering at North Carolina State University, Raleigh. On Jan. 1, NAACP launched economic sanctions against the tourism industry in South Carolina to pressure the state to stop flying the Confederate flag over its Capitol building. The flag, which NAACP considers a symbol of slavery, was raised in

Clockwise from rear left: Carson, Young, Wells, and Bunyard.

1962 to commemorate the Civil War centennial.

In announcing the sanctions, NAACP stated that all previous attempts to remove the flag "have been quashed by legislators who have sole power" over its placement. "South Carolina is the only state to fly the Confederate flag over its Statehouse," it noted (<http://www.naacp.org>).

Implications of the boycott began to trouble DeSimone. He had accepted an invitation to speak at the workshop, and his graduate students would be attending with him. "I have a very diverse group of graduate students," DeSimone tells C&EN. "I wanted to have everyone feel comfortable about participating in that meeting. Our group is really focused on fluoropolymers and this is our preeminent meeting. I brought up the issue of the boycott with my senior graduate students and we had a good healthy debate about it."

The students decided they wanted to take an active part in supporting the boycott. Together with DeSimone, they composed a letter to the organizer of the workshop—Dennis W. Smith Jr., an assistant professor of chemistry at Clemson University, in Clemson, S.C.—in which DeSimone stated: "My graduate students and I support the NAACP's position that this symbol of institutionalized racism should be removed from the seat of current political sovereignty. As the Fluoropolymer Conference is currently planned to take place in Charleston, S.C., my research group must regretfully forego participation, and I must rescind my agreement to give an invited lecture." He suggested that the organizing committee postpone the conference until a new location could be found.

Smith swiftly alerted the Polymer Division's executive committee about DeSimone's decision, but indicated that the organizing committee unanimously recommended not moving the workshop. The decision to relocate it was not reached "without some debate," Smith tells C&EN. "There were differences of opinion between the organizing committee and members of the executive committee that had nothing to do with the flag or racism. They had to do with



whether a scientific organization should support or condemn the actions of special-interest groups that are unrelated to its charter. It was a constructive debate, and we're all stronger for it."

DeSimone's senior graduate students—Clay Bunyard and Jennifer Young, who are white, and Terri Carson and Sharon Wells, who are black—hail from Mississippi, Maryland, North Carolina, and South Carolina, respectively. After researching the history of the Confederate flag, they concluded "it serves as a symbol for various modern-day groups that advocate white supremacy," Carson tells C&EN.

Flying the flag over the Capitol is upsetting to people who believe the flag represents slavery or white supremacy, Bunyard elaborates. He acknowledges that some people view the flag as a symbol of their past or the struggles of the South, but says: "I don't think it's necessary to place it over the Capitol. It could be moved to a more historically significant place such as the monument to the people who fought in the Civil War. And NAACP is amenable to that."

Commenting on the relocation of the workshop, Smith says: "The organizing committee respects the decision and wisdom of the executive board, and we're all happy to move forward and go to Savannah and have a great conference." Meanwhile, the four UNC graduate students have had "nothing but positive feedback from their fellow students and their families" for the role they played, DeSimone says. "They are excited to be able to make an impact."

According to data provided by NAACP, 75 groups had relocated events scheduled to be held in South Carolina as of Feb. 23.

Mairin Brennan

"My graduate students and I support the NAACP's position that this symbol of institutionalized racism should be removed from the seat of current political sovereignty. As the Fluoropolymer Conference is currently planned to take place in Charleston, S.C., my research group must regretfully forego participation and I must rescind my agreement to give an invited lecture."

UNC 2000

Impactful Moments

June 8, 2020

As members of the International Advisory Board of *Angewandte Chemie*, we are taking action together today to resign from our positions. This moment in history demands actions that are highly visible, and this action is intended to call as much attention as possible to the clear need for drastic change at *Angewandte Chemie*.

We believe the disturbing act of *Angewandte Chemie* accepting and publishing an essay that promotes racist and sexist views points to a larger problem wherein systems in the journal's publishing practices have suppressed ethnic and gender diversity. While it is currently unclear what actions the journal plans in response to this event, the initial response saying that the early-view version of the essay was not the final version is baffling. This essay was submitted, sent out for peer-review, reviewed, accepted, and published. This does not happen by accident. We, as a group, denounce the essay itself and the process by which it was published.

The advisory board is far from representative of the composition of the larger chemistry community, something highly problematic in itself. As such, if *Angewandte Chemie* seeks to take meaningful action to change its publishing practices in a way that benefits all of those in the chemistry community, then our resignation today provides the journal with an opportunity to reconstitute the Board in a way that reflects our broader community and society. Doing this will help in providing a path forward for the journal to remake itself and lead in a way that promotes a future for our field that rejects institutional racism and sexism and instead visibly and clearly embraces diversity and inclusivity.

Historically, *Angewandte Chemie* has been regarded as an elite international journal in the field of chemistry. It is time now for the journal not only to confront, be held accountable for, and correct its actions, but also to adopt a leadership role in championing diversity and anti-racism for a better future for our students and colleagues, especially those underrepresented in our field who, in their current positions, continue to face enormous hurdles of inequality and institutional discrimination.

Frances H. Arnold
Cathleen M. Crudden
Joseph M. DeSimone
John F. Hartwig
Craig J. Hawker
Kenichiro Itami

Eric N. Jacobsen
Robert S. Langer
David W. C. MacMillan
W. E. Moerner
Peter G. Schultz
Timothy M. Swager

Jack W. Szostak
Ralph Weissleder
Younan Xia
Richard N. Zare

Convergence & Diversity

EDITORIAL

INNOVATION

Driving Convergence with Human Diversity – Joseph M. DeSimone and Crista L. Farrell

- “We learn the most from those we have the least in common with.”
- “History shows that the most innovative solutions often arise from diverse teams composed of talented individuals with different areas of expertise, backgrounds, and life experiences.”
- “Without being intentional about human diversity, we risk detracting from the opportunity that exists to achieve innovation and societal impact through convergent science.”

Diversity is a Fundamental Tenet of Innovation

- A fundamental insight:
 - *In problem solving, diversity is powerful stuff.*
 - It doesn't always trump ability, but it does so far more often than we'd expect
- Does this logic imply that we should abandon the meritocracy?
 - No! Ability matters.
 - But—here's the catch—diversity matters too!

Scott E. Page

Scott E. Page

“Zero to One: Notes on Start-ups, or How to Build the Future”

Peter Thiel

What important truth do very few people agree with you on?

0 to 1 progress vs 1 to n progress

Academic vs private sector for \$\$

Convince people of a plan to build a different future

Words of wisdom

“You do not merely want to be considered just the best of the best. You want to be considered the only ones who do what you do.”

Jerry Garcia



Culture of Convergence

*“Knowing is not enough; we must apply.
Willing is not enough; we must do.”*

Goethe



Key Ingredients in Going from Invention to Innovation

- The best design teams are the most diverse
- Mentorship and apprenticeships are essential
- Strategy is all about being different
- The most fertile ground for innovation lies between fields
- Partnerships with domain experts are critical
- Be in the 10X club!
- This is a contact sport...

Convergence & Diversity

"There is no more fertile ground for innovation than a diversity of experience. And that diversity of experience arises from a difference of cultures, ethnicities, and life backgrounds. A successful scientific endeavor is one that attracts a diversity of experience, draws upon the breadth and depth of that experience, and cultivates those differences, acknowledging the creativity they spark."

J. M. DeSimone
NSF STC, 2005

Joseph M. DeSimone, PhD

Department of Radiology, School of Medicine

Department of Chemical Engineering, School of Engineering

Stanford Graduate School of Business (by courtesy)

Stanford
University

