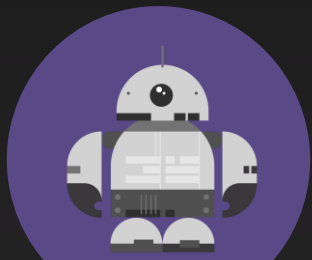




MARKET
DISRUPTION
AND ECONOMIC
DOWNTURN



ACCELERATING
AUTOMATION OF
CHEMISTRY



STRAINED
PIPELINE AND
CHANGING
WORKPLACE



CONTINUED
GLOBALIZATION
OF CHEMISTRY



CHEMISTRY AND
SOCIAL
RESPONSIBILITY



EMBRACING
OPEN SCIENCE



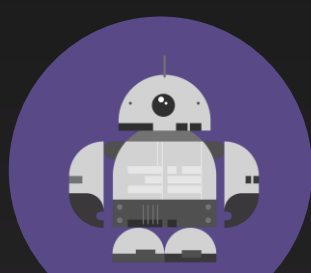
SCIENTIFIC
DOUBT AND
POLARIZATION
IN THE U.S.

2020 ACS Change Drivers



MARKET DISRUPTION AND ECONOMIC DOWNTURN

- The world is facing an economic downturn as a result of the COVID-19 pandemic.
- Petrochemical production and investment has been increasing leading up to 2020, revealing opportunities in emerging economies.
- Market disruptions and issues of supply pose a threat to the industry.



ACCELERATING AUTOMATION OF CHEMISTRY

- Artificial intelligence (AI) and machine learning are increasingly being used in data mining and chemical manufacturing.
- Lab-based research is more commonly being outsourced.
- Clean energy is a motivator for technological advancements.
- Automation has security and workforce implications.



STRAINED PIPELINE AND CHANGING WORKPLACE

- Economic, institutional, and immigration issues disrupt the chemistry workforce pipeline.
- Millennials and Gen Z will soon make up the majority of the global workforce.
- Advancements in technology may address workforce shortages but will require new skills of employees.
- Workplaces and meetings have shifted to being increasingly virtual.



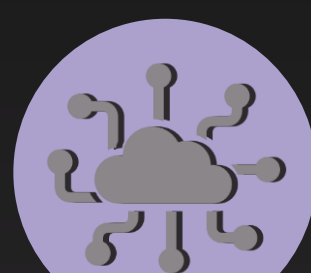
CONTINUED GLOBALIZATION OF CHEMISTRY

- Asia is rapidly prospering and becoming the focus of the scientific enterprise.
- Foreign investment into Asia continues to grow.
- Concerns around research quality in developing markets persist.
- Recent years have seen particularly acute and intensifying geopolitical tensions.



CHEMISTRY AND SOCIAL RESPONSIBILITY

- Chemistry has room to be more diverse and representative.
- Investment in diversity, equity, and respect (DEIR) is growing.
- Consumers have higher expectations for safe, ethical, and transparent practices in the chemical industry.
- The industry continues to move towards a “greener” future.



EMBRACING OPEN SCIENCE

- Many influential funders and policy makers support open science and require open access to articles and data.
- Revenue from open-access publishing comes at the expense of traditional subscriptions.
- Preprint publishing is a growing means by which chemistry research is disseminated.
- The COVID-19 pandemic has spurred calls for open science.



SCIENTIFIC DOUBT AND POLARIZATION IN THE U.S.

- Americans are divided on key scientific issues and have differing levels of trust in scientists.
- Common online sources of scientific information are unsubstantiated.
- U.S. policy has reflected a shift away from scientific research and towards deregulation, particularly with regards to environmental protections.