Type them into questions box!

“Why am I muted?”
Don’t worry. Everyone is muted except the presenter and host. Thank you and enjoy the show.

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Whether you are just starting your journey, transitioning jobs, or looking to brush up or learn new skills, the ACS Career Navigator has the resources to point you in the right direction.

We have a collection of career resources to support you during this global pandemic:

- Professional Education
- Virtual Career Consultants
- ACS Leadership Development System
- Career Navigator LIVE!
- ChemIDP
- College to Career
- ACS Webinars
- Virtual Classrooms

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https://chemidp.acs.org

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SARBAJIT BANERJEE
Professor, Texas A&M University and Senior Editor, ACS Omega

DEEKSHA GUPTA
Associate Director-India, American Chemical Society

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Making the Most Out of Your Ph.D. Journey: Research, Skills, and The Great Beyond

Sarbajit Banerjee

Department of Chemistry | Department of Materials Science & Engineering

TEXAS A&M UNIVERSITY

Senior Editor, ACS OMEGA

My Personal Journey
Undergraduate Degree in Chemistry (1997-2000)

St. Stephen’s College, Delhi

PhD in Chemistry (2000-2004)

Stony Brook University, The State University of New York
PhD in Chemistry (2000–2004)

Stony Brook University, The State University of New York

Post-Doctoral Research in Applied Physics

Assistant/Associate Professor of Chemistry (2007-2014)

University at Buffalo, The State University of New York

Initial Group at University at Buffalo
Professor of Chemistry/Davidson Chair (2014-Present)
Texas A&M University

Materials for Energy, Electronics, & Infrastructure

Mechanistic understanding and design of photocatalysts, electrocatalysts, and insertion electrodes for Li and ‘beyond Li’ energy storage

Materials & Architectures for Brain-Inspired Computing

In Situ Resource Utilization for Sustainable Buildings & Space Infrastructure
Current Research Group (our first post-COVID in-person group meeting, June 2021)

What our students do after… 22 PhDs graduated, >75 UGs

Dr. Robert Dennis: Goodyear Tires
On the safe side of driving.

Dr. Brian Schultz: Founder, Dimen
Light without heat

Prof. Jesus M. Velazquez: Assistant Professor, UC Davis
Heterogeneous catalysts for CO₂ reduction

Dr. Gregory Horrocks: Air-Force Research Laboratory
Energy storage

Prof. Luisa Whittaker-Brooks, Associate Professor, University of Utah
Turning heat to electricity

Dr. Katie Farley: Praxair
Adsorbents and gases.

Prof. Chris Patridge: Associate Professor, D’Youville College

Dr. Peter Marley: Research Scientist, Ferro
Dielectrics for chemical and mechanical polishing

Some recent student distinctions...

Abhishek Parija, Advanced Light Source—Molecular Foundry Fellowship

Luis R. De Jesus, National Science Foundation Graduate Research Fellowship
Eberly Post-Doctoral Fellowship at Pennsylvania State University

Justin L. Andrews, NASA Space Science and Technology Research Fellowship

Rachel Davidson, Intelligence Communities Postdoctoral Fellowship

Erick Braham, NSF D/EM Fellowship

David Santos & Nic Cool
2019 NSF Graduate Research Fellows
Which of the following describes you best?

- Undergraduate Student
- Master’s Student
- PhD Student in Years 1-2
- PhD Student in Years 3+
- Post-Doctoral Researcher

* If your answer differs greatly from the choices above tell us in the chat!

Beginning your PhD Journey: Is a PhD for you?

MrPells Science Resources
https://www.sciencenewsforstudents.org/article/proud-be-different-stem
What are you looking to get out of your PhD?

- An investment in yourself and a means of broadening your horizons
- A chance to create new knowledge and to potentially make a difference in the real world
- Training for a career in academia, industrial research, government labs, policy, and many other important roles
- Not just a cop out to escape a competitive job market
- Not just a next step when you have nothing else planned
- Not a continuation of undergrad education
- Not (necessarily) a road to riches

Understanding graduate school!
How do I choose the program that is right for me?

• There are around 200 PhD programs in chemistry in the US (many more outside...)
• The choice is yours...
• Do your research: websites, social media, friends, mentors, conferences, graduate fairs, publications, face-to-face meetings (ok, maybe not right now!...)
• Try to imagine what you expect for yourself from graduate school and after – research, cost of living, class/groupmates, fellowships, jobs after graduation, etc. Then check the facts at the program you are considering.
• There probably is not an absolutely perfect program.

What goes into an application?

• Transcripts
• Letters of recommendation
• Essay aka personal statement aka statement of purpose
• CV and the accomplishments in it
• Description of past research experience, maybe
• Application fee (waivers can be available)
• TOEFL/IELTS
  • GRE General and GRE-Chemistry – not any more?
So what really matters? Understanding holistic review

• The whole package is important – a single parameter would have to be really bad to be solely responsible for a rejection
• We look for evidence that convinces us that an applicant will do well in graduate school
• The whole app does not have to be perfect, but there should be items in it that make you stand out
  • U/g research experience
  • Strong, credible letters from credible references
  • GPA, standing, awards
  • Experience outside of your home institution (or outside of the country) is a plus, but is not expected for all
  • No expectation of definitely having an u/g or MS publication

Considering your options

• Read offers carefully:
  • Stipend, fees, tuition, insurance
  • Cost of living? Graduate housing?
  • TA/RA support?
  • Conditions on any of the offered support?
• Research output
• Infrastructure
• Are the students happy?
• Where do (strong) graduates go?
• Are there groups you really see yourself in?
• Advisor selection process
• Should you contact individual faculty?

Explore research areas beyond what you did as an undergrad
Graduate School is Different…Making the transition

...waiting for direction to charting your own course

...consumers of knowledge to creators of knowledge

...answering questions to asking the questions and justifying why these are good questions to ask

...memorizing facts to questioning assumptions and critiquing the literature

Selecting a Research Advisor

✓ Availability and extent of engagement
✓ Available research projects
✓ Ownership of ideas and authorship on publications
✓ Financial support
✓ Travel to professional meetings and networking opportunities
✓ Expectations regarding time commitments
✓ Expectations for a doctoral dissertation
✓ Previous student outcomes (in case of established faculty)
✓ Alignment with career goals
✓ Research group environment

"Your adviser will probably tell you what to do at first, but the initiative is on you. You have to own your research, especially as you get older and more skilled. There will be times when you might spend a whole week thinking about how to solve a problem that your adviser considered a few times while sorting through his or her pile of email. It’s ok to give your adviser some push back as you gain experience, it’s probably even highly advised…”
Building a Personal Mentoring Network

- Advisement on research
- Potentially securing financial assistance
- Helping you perform at your highest potential
- Connecting you to resources
- Ensuring you get credit for your scholarly research
- Advocating for you in different settings
- Providing guidance on career directions

“Embrace the wider (even global) academic community”

- Find collaborators and build a community
- Secure travel grants and build your network
- Be proactive within the university—seminars, workshops
- Engage with your dissertation committee

Think Ahead and Plan Backwards

Chart your own course—take responsibility for your own grad school experience—you will get out of it what you put in

Set deadlines for yourself, actively track your progress, seek help as needed, structure your time to establish a healthy balance

6. Your productivity varies as (effective productive time spent per day) * GPA.
7. Your productivity also varies as 1/(your delay in analysing acquired data) * GPA.
8. Take data today as if you know that your equipment will break tomorrow.
**What do you plan to do after graduate school?**

- Look for a post-doctoral position
- Seek employment in industry
- Ultimately interested in an academic position
- Explore options in government labs
- Other options beyond the “beaten path”

*If your answer differs greatly from the choices above tell us in the chat!

**Some Thoughts…**

- Guard your time. The Wildly Successful do not have more of it. They just use it better.*
- Communication is key: communicate clearly, directly, and honestly.
- Working hard is integral, but **being tired should not be worn as a badge of honor.**
- Don’t give up the power you have over your life. Make choices and exercise control (agency).
- Know that you are not alone, and reach out to others.
- Mental health is as important as physical health. Take care of oneself.
- Graduate student journeys are individual. Don’t compare, and follow your path.
- Failure is the norm rather than the exception—learn to move “upwards and onwards”
- Take advantage of opportunities as they come along…

Dean DePauw, https://graduateschool.vt.edu/about/deanscorner/tips-for-thriving.html
Developing Professional Skills

- Writing Skills
- Digital and Oral Communication
- Scientific Ethics
- Technology Commercialization
- Entrepreneurship
- Public Outreach

**Audience Survey Question**

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT

Looking to the year ahead, what are you MOST anxious about?

- Challenges in research and publication
- Delays in completing dissertation (because of COVID-19 and other reasons)
- Lack of clarity regarding career path
- Uncertainty about career prospects
- Personal and financial challenges

* If your answer differs greatly from the choices above tell us in the chat!
If your research does not generate papers, it might as well not have been done. “Interesting and unpublished” is equivalent to “non-existent.”

• Does my data “tell a story” or are they merely disconnected pieces of information?

• Do my results move the state-of-knowledge for the field forward?

• Is the information I have collected relevant to others?


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Every Talk is a “Job Talk”

Good presentations always involve significant work in their preparation and rehearsal (even for faculty) ...give yourself plenty of time to prepare

Tell a Story

Research is often non-linear, involving significant backtracking and dead ends

Present the data in the clearest way, not necessarily the correct chronological order

Training in Entrepreneurship

Audience

Why, and to whom, are you giving this presentation?

What do you want the audience to learn?

Stand where the figures can be seen
Look at people during presentation (or a select few)
Be enthusiastic
Do not worry about stopping to think and do not rush
Figure out which slide is your half-way mark and use that to check your time
Avoid overuse of the pointer (small controlled bursts)

Do not forget acknowledgements, always give proper credit
Explore Various Career Paths

- Professional societies
- Alumnae from your research groups and institutions
- Social media
- Career workshops
- Career services at your institution

What are the specific skillsets you need to develop?

Understanding expectations for internships

Evolving your mentor and peer network with your career aspirations

Getting the basics right with job applications

“The only limits in our life are those we impose on ourselves.” - Bob Proctor

Strive for Balance: You are not alone on this journey

Take a nap!

Eat chocolate!

Changing the Culture of Chemistry
Mental Health in the Lab

Watch the webinar on-demand
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