

PHYSICS INSIDER

WINTER 2016, ISSUE 1



X38 Flight Test



AERCam Sprint Free Flyer

Leading physics graduates to careers that positively impact the world, shape technology and fuel their ideas.

WONDERING HOW ALL YOUR HARD WORK WILL FIT INTO THE MARKETPLACE?

Navigation

It can be daunting to take the initial steps to find a job as you approach graduation. No matter where you are in the process there is a lot you can do to position yourself well for an excellent start to your career. With a solid strategy for course and project selections, minors, certificates and internship, you will find yourself uniquely suited to compete for the most coveted jobs in industry today.

Guidance

What is the right strategy for your interests, skills and passion? What is the right combination of course work, projects and work experiences to put you ahead of the pack in the job market? How do you start to focus on the industry sector and/or specific companies that suit your interests and goals?

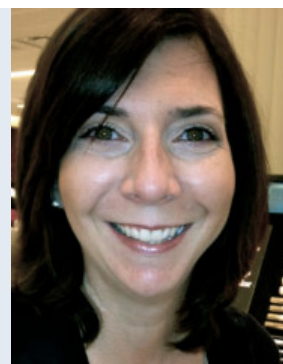
Control

You already possess everything you need to be successful and positively impact the world. The trick is getting others to see your unique value in the marketplace. Physics graduates are uniquely positioned to close the skill gap in industry today. We are high value adds to any technical endeavor. The key is highlighting that message in a way recruiters are ready to receive it.

A bit about me:

A physics graduate myself; I have created a career path that has allowed me to work on incredible projects with world-class teams. From Argonne National Lab where I developed control system software for the ATLAS particle accelerator, to NASA/Johnson Space Center where I worked Space Shuttle, X38, AERCam and Orion programs, to my current position with Intuitive Machines, an engineering think tank, where I develop software and lead projects in the aerospace, energy and medical sectors.

In fact, I've worked every project pictured in this newsletter! Navigating industry and finding your niche is a challenge, but I know the way and can help you find your path to an outstanding **future in physics**.



The Skill Gap

Industry is deeply invested in the traditional skill set structure, with separate departments for fields like Mechanical Engineering, Electrical Engineering, Software, etc.

There is a shortage of people who live on the edges of these fields, connecting systems and tackling the toughest (and most fun) problems of bringing a project from ideation through design and into production and operations.

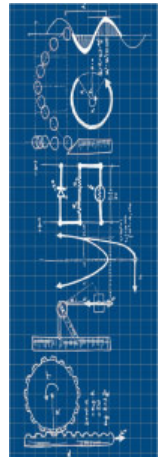
The current, traditional approach is no longer the right fit for building novel products. The lines between technical roles are blurred now more than ever and we need to shift teams and organizations to better suit the work at hand.

There are more efficient ways to design and develop projects that don't depend on tossing tasks back and forth over these organizational boundaries, which is expensive and inefficient.

This cross discipline skill gap is good news! It is a gap that is readily answered by the unique skill set and problem solving approaches that physics graduates bring to a team.



The Orion Spacecraft during stacking operations



CROSS DISCIPLINE ADVANTAGE

As a physics graduate you already have what you need to be successful in industry, an innate curiosity about how things work, a systems approach to solving difficult problems and attention to detail that carries through your work. The secret to landing your perfect job is shaping your skills to fit industry recruiting expectations. It's not always intuitive but it is definitely possible.

For example, I have personally worked on all of the projects pictured in this letter (and a few more in fact!) and made a path from physics graduate to a successful career. I've built control systems for particle accelerators, simulations for spacecraft, flight software for multiple space systems and software applications for medical devices. It was the cross discipline abilities I gained as a physics student that have enabled me to create my career. I look forward to sharing tips and context to help you make your path from student to a successful career.

Your ability to span traditional discipline areas (electronics, software, embedded systems, dynamics, etc.) is **highly** valuable. It's crucial that you highlight this cross discipline skill and your ability to build and deliver.

CAREER STRATEGY

As you move through your studies as a physics student there are opportunities surrounding you that will put you ahead of the competition. There are many options to earn a minor or second major without adding a tremendous workload.

One I personally found very useful was getting a minor or second major in computer science. Recruiters know this is a very high demand skill; it gets you in the door and gives you a chance to highlight how much more you bring to the table.

Internships are invaluable to landing a first job that is more than a standard “entry level” position. However, it is not enough to simply list projects you’ve worked on no matter how amazing they sound. You need to show what you built on those projects: Describe the avionics system you designed, the software you developed to bring data from the sensor to processor and have that signal incorporated in a software architecture to bring a vehicle or robotic system to life, explain how the analysis tools you built advanced the project.



Intuitive Machines – IntuitIV Automated Catheter Development Team



X38 Drop Test Vehicle

Hiring Challenges

There *are* some challenges to finding your way through the recruitment and hiring process with a physics degree...

- Often times recruiters and hiring managers aren't quite sure where we fit into a team
- There is a concern that there will be significant ramp-up time for getting physics graduates up to speed with current industry specific tools
- Misconceptions of Physics graduates being interested in purely academic pursuits versus product oriented work

It is important to find a way around these misconceptions. Any physics student who has spent time in the lab can address all of these issues.

There is an art to gearing your interactions, resume and interviews to overcome these challenges.



Terrestrial Return Vehicle Drop Test

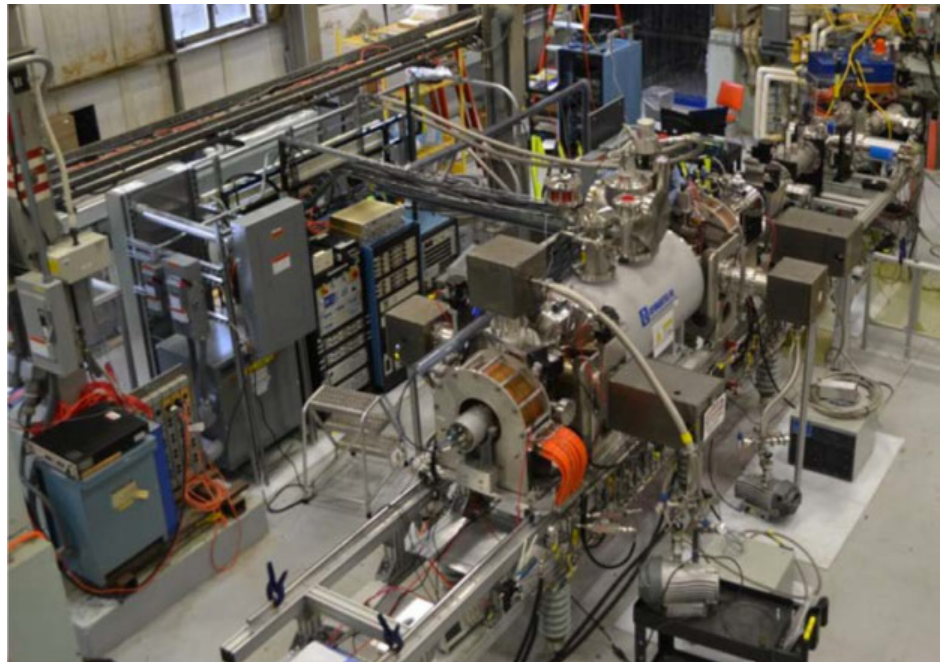
In your application and interviews highlight your ability to quickly pick up tools needed to complete a task, and how you integrated with other team members to find and resolve issues. This is what will grab a recruiter's attention and get you in the door!

A properly targeted internship will later lead recruiters directly to where you will fit into their organization. As you apply and interview for internships, look for opportunities that have you engaged directly with the technical team versus an "intern project" oriented experience where it is likely you'll be given some grunt work and have very little chance to interact with the team.

An internship should not only give you a feel for if the projects and team are a good fit for you, but should also pave the road to a permanent position where you are interning or with a related company.

Successful Internships

- ✓ Provide you with hands-on experience
- ✓ Embed you with the technical team vs. separate intern program
- ✓ Path-find for permanent positions in the future
- ✓ Allow you to contribute in a meaningful way AND give you powerful skills and connections to carry with you



ATLAS Accelerator at Argonne National Laboratory

experience build grow education internship prepare learn
 Research Physics cooperative Experience team REU



IGNITE YOUR NETWORK

Occasionally students, and those early on in their careers, don't realize they already have a network. It can make the first steps in looking for a job seem overwhelming! When I was a physics undergrad at The University of Iowa I definitely didn't think of myself as having a network I could leverage to help me kick start my career, but in fact, my network was all around me!

Through my undergraduate studies I had worked in a lab in the physics department, had a great advisor and had found a fantastic mentor who was one of my professors for several courses. I had also worked an internship where I had lots of connections and mentors.

I'll let you in on a little secret... successful people LOVE making other good, hard working colleagues successful! It is one of the most gratifying things you can do in your career. You don't have to be a social butterfly to build a powerful network. You simply have to follow your gratitude. That is your network!

Flying Solo

Often deeply technical people resist building and leveraging their networks. Possibly because they are so used to approaching challenges independently, or from concern over "bothering" others physics graduates.

This can lead to long and more importantly **unnecessary** delays in getting to a career that you are excited about.

While it is true that you can achieve great things on your own, there is a downside to this approach: you will be limiting your growth! Building and maintaining a solid network will be one of the best investments you make in your career.

The good news is that the first step in building your networks is easy! You begin by thinking about people you are thankful for. Those are the first nodes of your network!

For additional information, networking opportunities and customized coaching visit

FutureInPhysics.com

PHYSICS GRAD SPOTLIGHT

Joel Getchius has an extensive background working NASA and Department of Defense programs and is currently a Senior Development Engineer at Intuitive Machines

PI: What is your day-to-day work like at Intuitive Machines? Are you in a hands-on R&D or oversight role and has it changed significantly over your career?

JG: I'm more in a development and R&D role. My day-to-day job includes software development for a high fidelity simulation of subsea Oil and Gas operations during a well blowout. "Research" for the company typically involves developing technologies and software that could spring board into a future product or contract.



Joel Getchius - Intuitive Machines

However, I've spending some of my research time trying to collaborate with researchers in academia and government on more physics based stuff, with the hope that it grows into something more tangible. We will see.

PI: Do you have any specific advice you would give someone entering your field? Any mistakes you see new people often making in your field?

JG: I think everyone is different, and it's hard to give one set of advice. For example, if you absolutely know that you want to study solar neutrinos and be the world's expert in that field -- I'd give that person a different set of advice than someone who maybe like me, was unsure of my specific area of interest. It sounds trite but: (1) Enjoy the moment. Don't worry about 5-year plans, 10-year plans, etc. Don't say to yourself I want to be here by 30, there by 40. All that stuff is going to change. Don't get me wrong, goals are good, but realize your goals are going to change and evolve. (2) There is no such thing as a perfect job. Every place has its pluses and minuses. (3) Never, ever, be afraid to ask for something you want and never, ever second-guess yourself for pursuing it. The worst anyone can say is no. The best is you get what you want. (4) However, don't expect things to be handed to you. If you never communicate or pursue what you want, how is anyone ever supposed to help you achieve it?

The number one mistake I see young people starting out making, is not having a sense of perspective and a lack of patience in their careers. I'd advise everyone starting out to focus on establishing their reputations within an organization and develop expertise --- before expecting the organization to bend to them.

Experience

Called many different things: internship, cooperative education, Research Experience for Undergraduates (REU) they key with all of these programs, is that you get to *experience* working in your target environment, interacting with technical teams and delivering products to leadership and customers. In each issue you will find additions to this list of opportunities and you can always access the full list at **FutureInPhysics.com**.

- NASA/JSC Pathways Program

<http://pathways.jsc.nasa.gov/>

- American Physical Society

<http://www.aps.org/programs/education/undergrad/physicsreu/>

- Fermilab Summer Internships

<http://ed.fnal.gov/interns/programs/>

- National Science Foundation

http://www.nsf.gov/crssprgm/reu/reu_search.jsp

- Intuitive Machines

<https://intuitivemachines.com/about/careers/apply>



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Many thanks for
your insights,
inspiration and
contributions!



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