

# FIAP Winter 2019 *Newsletter*

American Physical Society Forum on Industrial & Applied Physics

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Opinions expressed represent the views of the individual authors and not the American Physical Society or author's employers.

## Letter from the Editor

March Meeting 2019 is right around the corner, and with more than 11,000 attendees expected, FIAP is looking forward to exposing members to the latest in Industrial and Applied Physics. In this letter, we outline some of the FIAP-sponsored sessions at the March Meeting, election results, and a brief history of FIAP as we approach our 25th anniversary. FIAP distributes this newsletter to ensure the larger community can follow the latest developments

within the Forum, esp. at APS Meetings, to highlight FIAP activities and to engage with the Industrial and Applied Physics community. Any additional contributions are welcome, and we would like the newsletter to provide an outlet for discussions of interest to the FIAP membership. To submit articles, letters to the editor, or ideas for discussion, please contact me at [fiap\\_newsletter@aps.org](mailto:fiap_newsletter@aps.org).

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## FIAP at the March Meeting

In addition to the contributed sessions in the various sorting categories, FIAP will also sponsor or cosponsor nine invited sessions at the March Meeting 2019. These sessions include topics ranging from the latest scientific research to discussion of careers in physics outside of academia. These sessions are a highlight of FIAP's technical contribution at the meeting, and will complement other FIAP-sponsored activities, including careers events that happen throughout the week. Also, this year, most FIAP sessions will be in adjacent rooms for session '33' and '34'

In fitting with FIAP's broad scope, the sessions have a wide variety of topics with the theme "Physics for Tomorrow". They will run continuously from Tuesday morning through Thursday afternoon. The sessions begin on Tuesday morning with "Radiation Detection and Monitoring in Medical Imaging and Therapy" (co-sponsored with GMED- the Topical Group on Medical Physics), moves on to "Polymer Physics to Address the Dual Energy Challenge at Global Industrial Scale" (co-sponsored with GSOF- the Topical Group on Soft Matter), and finish the day with a retrospective on "Five Decades of Physics at ExxonMobil Corporate Strategic Research". The Wednesday sessions change focus toward "Future and Evolving Careers of Physicists" (co-sponsored with FECS- the Forum for Early Career Scientist), keep the "Future" theme with "Future of Transportation" (chaired by FIAP Vice-Chair Mike Gordon),



and round out the day with "Recent Advances on Spintronics-based Computing: from Deterministic to Probabilistic". Finally, on Thursday, FIAP picks up an entrepreneurial theme, starting with "Live Long and Prosper as Physicist, Innovator, and Entrepreneur" (co-sponsored with FED-the Forum on Education) then "Entrepreneurial Physics" (chaired by FIAP Chair Matt Kim), and finishes the week with "Innovations from Industry" (chaired by APS Industrial Physics Program Manager Steven Lambert).

Anchoring these events is "Industry Day", which happens every March Meeting on Wednesday, and concludes with the FIAP Business Meeting and recognition of new FIAP Fellows. More information on Industry can be found at the [Industry Day website](#) and for your convenience, we have assembled a brochure with all of the FIAP-sponsored sessions along with other information on Industry Day and FIAP, available in print at the meeting or via [download](#).

FIAP is looking forward seeing everyone in Boston. Please attend our series of exciting invited talks at the March Meeting.

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## FIAP Election Results

With the Executive Committee managing FIAP's functions, elections to fill these positions are vital to the continued health of FIAP. As was announced in an email distributed in December, last year's election concluded on Nov. 9th to fill two Members-At-Large vacancies, the Vice Chair, and a ballot measure approving changes to the by-laws. We are happy to welcome Matthew Thompson (TAE Technologies, Inc.) as the incoming Vice Chair as well as Edlyn

Levine (MITRE Corporation and Harvard University) and Curt Richter (Physical Measurement Laboratory, National Institute of Standards and Technology) as the Members-at-Large. They will be attending their first meetings in their new positions, and we look forward to working with them as the latest members of the FIAP team.

# Report on the Impact of Industrial Physics Released

The APS Industrial Physics Advisory Board commissioned and issued a report entitled “The Impact of Industrial Physics on the U.S. Economy”, which outlines how important Industrial Physics is as a technology engine for the U.S. economy as a whole. This data was then used and distributed during the annual “Congressional Visit Day”, in which APS leaders and members interacted directly with their elected officials in Washington.

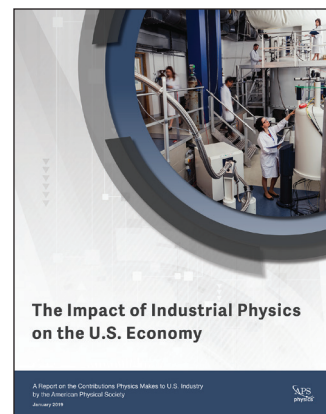
In the report, labor statistics, industrial output, and other U.S. government data were analyzed by experienced economists to highlight impacts including:

**Economic Impact:** U.S. physics-based companies directly contributed approximately \$2.3 trillion to the U.S. economy (12.6% of GDP) and exported about \$1.1 trillion of goods in 2016.

**Job Creation:** Approximately 11.5 million people were employed by U.S. physics-based companies in 2016, 6% of total employment.

**Most Physicists Work in Industry:** Approximately 70,000 physicists joined industry from 2003-2016 or about 58% of all physics graduates.

This report follows years of advocacy on the subject, and is an important tool to use when physicists interact with people who may not immediately appreciate what physicists do, not just in academic settings, but in the industrial and innovation economy. After all the effort it required, esp. with the leadership of the Industrial Physics Advisory Board, we recommend that FIAP members download and familiarize themselves with the report.



## A Brief History of FIAP by Dr. Judy Franz

I was selected to be the new Executive Officer of APS at the end of 1993 and started my position in the spring of 1994 just after APS headquarters had moved from New York to the DC area. It was a time for new beginnings and expansive thoughts. Charlie Duke at Xerox was chairing the Committee on Applications, and he suggested that APS should start a new Forum that would better serve the broader physics community. As a condensed matter physicist who learned solid state physics from John Bardeen, I knew that

great physics was being done at places like Bell Labs (the AT&T research lab) and IBM, but Charlie's idea went way beyond this. APS should be the American “Physicists” Society and most physicists were not doing basic research but were actively involved in creating and developing applications of physics. I liked this idea and Charlie and I sold it to the APS leadership and Council. Thus the Forum on Industrial and Applied Physics was created and quickly grew to be the largest APS unit.

## Distinguished Lectureship Award on the Applications of Physics

Dr. Cynthia Keppel, this year's Distinguished Lecturer, will be giving her inaugural lecture, titled “Career Opportunities from Fundamental Physics to Patient Treatments”, on Wednesday at 10:24-11a in Session K34 (Room 205A). Working at Thomas Jefferson National Accelerator Facility, Dr. Keppel received the award “For pioneering work in proton therapy and for the promotion of the applications of physics to both experts and non-experts”. We encourage all to attend and to congratulate Dr. Keppel on both this prestigious achievement and for the opportunity to help young physicists understand a career in Industrial and Applied Physics.

This follows a very busy year for Dr. Robert Kleinberg, our current Distinguished Lecturer. The Award requires not only a lecture or talk be given at the March Meeting, but also that the Distinguished Lecture be given at no less than 3 other events throughout the year. Dr. Kleinberg has gone “above and beyond” this requirement, giving 11 different lectures: at seven universities, two Section meetings, one corporation and the inaugural March Meeting talk. He found his direct interactions with students at ‘roundtable’ sessions to be particularly rewarding. We applaud Dr. Kleinberg's

efforts and appreciate his willingness to engage with early career physicists. Dr. Kleinberg reflects on his experience during the Distinguished Lecture in an article which will soon appear in *Physics and Society*, the quarterly newsletter of the Forum on Physics and Society, to which we will link when it is published.

Each year, the Forum on Industrial and Applied Physics (FIAP) and the Committee on Careers and Professional Development (CCPD) recognize a physicist who has distinguished themselves in an industrial or non-academic career through the Distinguished Lectureship Award on the Applications of Physics. Would you like a colleague to be recognized for all that terrific work done over many years? More information on Dr. Keppel and the award can be found at [this link](#).



# Promoting Innovation and Entrepreneurship in Physics

APS continues its activity in the area of promoting innovation and entrepreneurship within physics. This year is the final year of the APS PIPELINE project, which is funded by the National Science Foundation and is a collaboration between several physics departments focused on teaching physics in a way which will explicitly prepare students for careers in industrial and entrepreneurial settings. Deliverables will include curricula and activities which teach physics students core scientific and technical competencies, work skills (e.g. communication, teamwork, an appreciation of the importance of cross-disciplinary collaboration), and a familiarity with fundamental concepts behind commercialization (e.g. value proposition, funding sources, intellectual property).

APS also recently submitted a proposal for a scale-up for PIPELINE which, if funded, would significantly increase the reach of the PIPELINE project to include more faculty members and see more widespread participation among physics departments. If you would like to learn more information about these efforts, please visit the [PIPELINE homepage](#), or sign up for our monthly [PIE newsletter](#).

APS has also worked with FIAP and the Forum on Education (FEEd) to sponsor invited sessions at the March Meeting focused on entrepreneurship, “Live Long and Prosper as Physicist, Inno-

tor, and Entrepreneur” and “Adventures of Entrepreneurial Physicists.” The former session will focus on key elements of making entrepreneurial efforts a success and also how physics faculty can incorporate innovation and entrepreneurship into their students’ experiences; the latter will showcase the individual stories of several entrepreneurial physicists. Both sessions are taking place on Thursday, March 7 – so if you are planning on attending the APS March Meeting, be sure to stop by and check out these exciting events.

While not every physics graduate will helm their own startup company, understanding how companies are built and how they make decisions will make students more successful in the private sector environments wherein they are overwhelmingly likely to work. By promoting innovation and entrepreneurship within physics, APS hopes to not only inspire students to think about using their scientific and technical abilities to solve problems and prepare students for successful careers in private sector environments, but also to help them recognize opportunities to address human need and move their solutions toward realizable technologies. The potential benefit of these efforts to mankind is enormous, and we hope that FIAP will continue to support physics innovation and entrepreneurship (PIE) activity at APS.

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## Free Job Postings for Internship Jobs

Now is the time to think about summer internships! The APS offers free job postings for internships which can help you find the best candidates, or the best internships. The postings also appear on the Physics Today Jobs site and are on-line for 60 days. You get access to a targeted audience of physics students plus members of AAPT, AVS, and the IEEE Computer Society. Free internship post-

ings are available year round, but remember this free service as you start planning for your summer programs. Don’t miss this chance to connect with students, share the interesting work underway in your company, and broaden your candidate pool for future job openings. You can find details on the [free internship job posting page](#) of the APS Careers website.

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## FIAP Chair’s Thoughts

FIAP has now been around for 25 years! I appreciate Dr. Charlie Duke’s input that we should recognize the auspicious beginnings of FIAP and I appreciate my discussion with Dr. Judy Franz and her thoughts for this newsletter about why FIAP was formed. If one looks at the FIAP newsletter of 1995 where Dr. Duke (2006 recipient of the FIAP George E. Pake prize) was quoted of saying “FIAP must satisfy its customers: the members.” is exactly right on. You see our customers are the students, the industrial scientists, and all those who are lost at the March Meeting. It is with this intent that we strive at the March meeting to find the needs of our customers. Please reach out to us if we can be of service to you. It is this direct dialogue with the students that we receive at the “Lunch with

Experts”; it is the direct dialogue with our industrial and applied physicists who attend “Industry Day”; it is the direct dialogue with our members who attend the business meeting on Wednesday at 5:30 or any of our events, that allows us to set the agenda for the following year and years to come. I hope to see you in Boston and take time to give us input and maybe join for a cup of coffee for some thoughtful discussions! I look forward to meeting our members and to satisfying their needs.

Thank you.

Matt