Physical Scientists in the Private Sector White Paper

I. Executive Summary

There are numerous opportunities for AIP to venture into the thought leadership space for the physical sciences with respect to the private sector. This report explores just three discrete ideas where AIP could leverage its structure as a federation and an institute to find success as a thought leader: Disruptive Technology & Tools, Convening Relationships, and Cross-cutting Societal Issues.

This white paper team conducted primary research and semi-structured interviews to help inform our brainstorming efforts. We found that there are many existing resources within AIP that can be pivoted to engage the private sector more effectively in thought leadership activities that immediately benefit AIP and its Member Societies. We recognize that any thought leadership activities must adhere to the strategic framework that AIP sets out for itself.

Measures for success for thought leadership regarding physical scientists in the private sector include:

- Helping our Member Societies to engage the private sector in learning about emerging technologies that have the potential to disrupt operational activities, such as blockchain and its effects on publishing;
- Improving AIP’s capacity as a convener to bring together private sector physical scientists with our Member Societies and Affiliated Societies to facilitate conversations, address issues of concern, and provide a united front for representing the physical sciences; and
- Engaging the private sector, our Member Societies and Affiliated Societies in campaigns that cut across broad societal issues that impact physical scientists.

The following analysis serves to provide some high-level insights into thought leadership for AIP as it weighs various areas where thought leadership possibilities for the organization exist.

II. Overview

a. Background and Research

As AIP approaches its centennial, it is imperative to take a holistic inventory of our organization and how we are serving, and can better serve, our primary constituencies – our Member Societies and the physical sciences community. After consulting with external partners, AIP began the process of determining how to begin the process of building our reputation as a though leader to the entire physical science community, with special attention paid to physical scientists working in private sector and industry – a demographic that AIP has historically had difficulty connecting with.

i. Why this topic?

Physical Scientists in the private sector are important to AIP, our Member Societies and Affiliated Societies through their diversity of knowledge and experience, their potential for mentoring early- and mid-career scientists, and their potential to provide financial support individually or through their organizations to support the missions of AIP and/or our Member Societies and Affiliated Societies.
The physical sciences enterprise in the private sector has changed tremendously over the last two decades, and AIP has been struggling to effectively engage the private sector during this period of rapid transition. This is an incredibly important community to AIP, and unfortunately, we have failed to evolve or innovate our programmatic offerings and operations to adequately nurture relationships with the private sector.

The private sector was chosen as an area to explore for thought leadership because of its potential for partnerships, growth and engagement for AIP and its Member Societies. Engaging the private sector also was identified as a recurring topic in AIP’s Statistical Research Center’s surveying of Member Society strategic plans.

ii. Why now?
This white paper exercise aligns with the forward-thinking vision of AIP’s Strategic Framework and is just one initiative that is part of a larger discovery process that’s occurred over the last 18 months.

iii. Definitions
To help our white paper team corral our research efforts, we thought it would be best to clearly define some of our terminology. For the purposes of this white paper, we are adhering to the following definitions:

“Physical Sciences” is broadly defined as the professional scope and activities of our Member Societies and Affiliated Societies, and the audiences they serve.

“Private Sector” is defined as any areas of work involving that physical sciences that exists outside of government, nonprofit, academic and NGO spaces.

iv. Literature review
The percent of physics PhDs who find employment in the private sector has steadily increased over the past several decades. A National Science Foundation survey identified that 56% of physics PhDs were employed in industry in the 1990s, compared to 36% in the 1950s. (Neuschatz, M and McFarling, M. NSF Survey of Doctoral Physicists, Washington DC, 2001)

Yet, despite an increased percentage of PhD holders finding employment in the private sector, AIP has experienced a significant decline in private sector engagement during the past 20+ years. Primary activities AIP conducted in relation to the private sector, including The Industrial Physicist magazine, the “Enterprise” column in Physics Today, and our Industry Leader Summits, have all ceased operations. AIP is also seeing a decline in two current touch points with the private sector, our Industrial Physics Forum and Corporate Associates Program. These preceding pain points are not endemic to AIP.

An American Physical Society (APS) report1 from 2006 identified numerous factors that contributed to its declining industrial physicist membership. Factors included priority changes of R&D funding; a decentralization of research that formerly occurred at large firms, such as Bell Labs, GE, IBM, Dupont and Xerox; a move to disparate pockets of research

1 https://www.aps.org/about/governance/task-force/upload/FINAL_REPORT_TF_on_Ind_Physicists.pdf
that is distributed globally across smaller firms; a paradigm shift for industrial physicists who used to conduct research alongside their academic colleagues; and other factors.

There also has been an increase in private sector physicists being grouped and classified categorically as engineers or other titles in the workplace, and oftentimes, they feel disconnected from the larger physical science community (this category of employees has been dubbed the “hidden physicist.”)

These changes are paramount to note because they outline a pattern of behavior in a new global economy, one in which the distribution of private sector physicists is more global in scope and less concentrated in the hands of several large marquee companies.

Another more recent report by APS, The Impact of Industrial Physics on the U.S. Economy, estimates that 11.5 million people were employed by U.S. physics-based companies in 2016, representing nearly 6% of total employment.

v. What was our methodology?
To guide our white paper research, we thought it would be best to look at thought leadership roles for AIP as a federation (the work we do on behalf of, and to assist, Member Societies, in advancing their missions), and as an institute (being a center of excellence in providing advice and programs to the broader community of physical scientists).

Our internal team met three times in person and had near-daily interaction via a digital hub over the course of six weeks. Each in-person meeting was 90 minutes, and prior to each meeting, sub-groups conducted research outlined in an agenda. Groups then reported out their findings to the larger group during meetings. Our first meeting looked at historical data and was treated as a literature review for our group regarding AIP’s relationship to physical scientists in the private sector. Our second meeting explored AIP’s existing resources, strengths and gaps regarding thought leadership for physical scientists in the private sector. Our third meeting saw the white paper team discussing big ideas that we felt merited further exploration. A complete listing of meeting agendas is included in the appendix of this report.

Following this final group meeting, the white paper leads compiled a draft presentation to provide the AIP Board updates in June. This report distills all research done up to this point, taking the AIP Board’s feedback from the June 2019 meeting into account.

b. What AIP is currently doing in relation to the private sector
We conducted 13 interviews with key internal stakeholders to ask them how their departments were connected to the private sector. These interviews included specific questions to tease out department-level contributions from the private sector, contributions to the private sector, and the overall relationship with the private sector. Edited excerpts from these interviews are below. Full, unedited interviews are included as an appendix to this report.

Broad takeaways from these interviews revealed that every area within AIP has something to offer the private sector as a federation or institute, but the offerings are disparate and diffuse

---

---

across the organization. Private sector physical scientists have such a wide field of interest, and it is incredibly tricky to strike a need and interest with the private sector, particularly given the broad spread of capabilities and skills amongst them.

Former activities that AIP conducted include The Industrial Physicist magazine, which had a controlled circulation business model. That magazine came out in the mid-90s and was halted partially due to lack of interest by advertisers. With downsizing of private industry, there also was less demand from the private sector for AIPP journals.

For a few years in the early 2000s, there was a full-time position within AIP that focused on the private sector. Lack of strategic guidance and the changing face of corporate R&D in the United States led to the phasing out of the position.

AIP also ran the active Corporate Associates (CA) Advisory Committee until the mid-2010s. Their principal role was organizing the annual Industrial Physics Forum, often held in conjunction with the Fall AIP Board meeting. Member companies brought attendees to corporate research labs for a two- to three-day event giving them an exclusive view into the work being done by private researchers. However, since these meetings were mainly attended by AIP representatives and researchers from a shrinking number of member companies, the conversations became very insular. This and the decline of large private research labs necessitated a change in direction.

AIP’s model for Industrial Physics Forums changed in the mid-2000s to focus on integrating industry sessions into Member Society meetings. This allowed presenters to give talks about what’s going on in industry with a different audience and bring new viewpoints for academics, students, and researchers.

In part with AIP’s assistance, several MS have started to build into their own programs more programming for those working in or working closely with the private sector. AIP currently provides funds upon request for MS meetings to support an industry-focused session, often focusing on employment trends and how attendees can find jobs in the private sector. But while these funds are available to all Member Societies, they are not uniformly sought.

Focusing on the departmental level, AIP has several connections with private industry. Government Relations often partners with industry on targeted advocacy efforts. While most relationships are issue specific and do not typically last, this type of corporate partnership has several benefits. Nonprofits are restricted in how they can spend money; Partnering with industry for lobbying in areas where we have common interests allows AIP to have a larger impact. Additionally, since companies already lobby a lot more than we do, we can tap into their connections. Partnering with corporate sponsors for events helps AIP get attention from people with actual power (congresspeople instead of their staffers) by putting on better events with guest lists that can attract lawmakers.

AIP does have some sustained relationships in this area. AIP is a member of the Taskforce on American Innovation3, a coalition of business, universities, and professional societies, which supports and promotes federally funded scientific research, particularly funding for physical sciences and engineering, and competitive grants. We also have partnered with similar pushes

3 http://www.innovationtaskforce.org/
such as the Innovation Imperative and the Business for Federal Research Funding Coalition. Additionally, private sector employees serve on the Public Policy Advisory Committee.

Private entities also serve as an invaluable source of sponsorship and development efforts. Several private sector employees are supporting the 2019 Physics Congress (PhysCon). Employers such as Texas Instruments, Thor Labs, Under Armour, and Lockheed Martin see the benefit of supporting the next generation of physical scientists—and appreciate the opportunity to get students thinking about non-academic jobs available to them later in their career.

Corporate sponsors tend to want to be more involved than just cutting a check. A sustained relationship that a sponsor can get involved with is a great PR opportunity for the general public and for employees who like to know their workplace is supporting worthy causes.

Other departments have limited but valuable interactions with the private sector. The Statistical Research Center maintains a list of companies that hire physical scientists and collects data on how many physics degree holders work in industry. AIP’s science policy news service, FYI, provides updates on issues that affect private interests, such as R&D budgets, aerospace, joint quantum initiative, etc. AIP’s Careers Toolbox helps students understand opportunities/careers for physics majors outside academia, apply for jobs, etc. AIP’s Career Network consistently hosts opportunities from private employers: while the proportion of industry jobs varies by job board, about 10-20% of the network postings come from the private sector. Physics Today uses industry contacts to provide information for stories and serves as a valuable source of news to physical scientists in industry who may no longer have access to academic journals.

c. What our Member Societies and Affiliated Societies are doing

For the purposes of this white paper, we decided to look at both AIP Member Society and Affiliated Society connections to the private sector. Research was conducted by scanning Member Society and Affiliated Society websites and exploring public-facing content and programmatic offerings that explicitly involved the private sector. The sub-group exploring this topic compiled a spreadsheet and list of activities that each Member Society and Affiliated Society has in connection with the private sector. Both are attached as appendices to this report.

Broad takeaways from our research revealed that AIP Member Societies and Affiliated Societies have varying degrees of connection points to the private sector. There were a handful of activities that are practiced by many AIP societies, with the most pervasive being career development materials, job boards and corporate associate programs. Many societies approach their corporate associate programs in a similar fashion, and their offerings for membership generally include promotion in publications and at events, access to job boards, expertise access (‘ask the experts’ forums or in-company trainings), industry data and assessments.

III. Big Ideas (What do we propose to do?)

Based on the research that was conducted over the course of this white paper’s first month, this team came back together for our third meeting to discuss what thought leadership could look like for AIP and physical scientists in the private sector. To help direct the conversation, we chose several pre-defined buckets that aligned with common themes that emerged during previous meetings. Those buckets are:

- Social Concerns (e.g., sexual harassment, climate change)
- Technology & Innovation (e.g., tech transfer, intellectual property)
- Knowledge Sharing & Dissemination (e.g., publishing, news, workshops and website)
- Workforce Pipeline (e.g., what will private sector need from personnel)
- Regulation & Policy (e.g., government relations, advocacy)
- Services (e.g., administering surveys)

During discussions, we opted to explore topics from a primary angle (either how it would affect our Member Societies and Affiliated Societies, or how it would impact the physical sciences community at large).

a. **Big Idea 1: Disruptive Technology & Tools**
As a group, we defined these as technology or tools that have the potential to cause shifts in the way Member Society and Affiliated Societies operate, how those societies serve physical scientists, and how the private sector operates within the context of the physical sciences. This also has implications for future employment opportunities for holders of degrees in the physical sciences, who could be the next to be co-opted in our ever-evolving “gig economy.”

i. **Impact on MSs**
There isn’t a centralized resource for AIP Member Societies and Affiliated Societies to access information about disruptive tools and technologies that are either emerging or on the horizon.

There are an array of existing resources for association management – such as ASAE, CESSE and others – that could underscore some future challenges our societies might face, but AIP finds itself at the center of these societies, equipped with specialized knowledge of the physical sciences sector. Do new technologies, such as blockchain, have the potential to upend the way that our Member Societies and Affiliated Societies interface with the private sector, and in turn, how the private sector embraces our societies? We think so.

We fleshed out hypothetical scenarios involving blockchain and publishing – an activity that closely ties many of our societies to their members and the private sector. Blockchain is a digital record of transactions. The name comes from its structure, in which individual records, called blocks, are linked together in a single list, called a chain. Each transaction added to a blockchain is validated by multiple computers on the Internet. These systems, which are configured to monitor specific types of blockchain transactions, form a peer-to-peer network. They work together to ensure each transaction is valid before it is added to the blockchain. This decentralized network of computers ensures a single system cannot add invalid blocks to the chain.4

Blockchain has implications for the entire pipeline of academic publishing, simplifying and decentralizing the process – in essence, cutting out, sometimes wholly or partially, the need for an academic publisher.

A brief write-up on the implications of blockchain on academic publishing can be found [here](https://techterms.com/definition/blockchain). An excerpt from the aforementioned linked article states:

4 [https://techterms.com/definition/blockchain](https://techterms.com/definition/blockchain)
“Say I just completed a paper on off-target effects of using CRISPR to treat sickle cell disease. Publishing it with blockchain would work like this: Using a browser, I upload the report to a blockchain-based publishing platform. Using an Open Researcher and Contributor ID (ORCID), which provides a persistent digital identifier, I can distinguish myself from other users on the platform. ORCID also provides a public sign-in mechanism that is perfect for dealing with researcher IDs.

Blockchain technology would enable my manuscript to be available from the moment it is submitted, creating an independent, decentralized, and immutable time-stamped proof of existence, authorship, and ownership.

Third-party companies have made huge profits from the work of scientists for many years, selling journals and reprints to a variety of institutions. In blockchain-powered scientific publishing, researchers would control whether or not institutions are required to pay to use their work, while making it freely available to the public and researchers alike, if they so wish.

Using blockchain technology, the entire editorial history and research quality of a manuscript could be evaluated continuously. If manuscripts are available from the moment they are submitted, even in early draft status, then the cumbersome process of re-submitting research would be eliminated and the dissemination of manuscripts would be greatly accelerated.”

Given the desire for open access in some regions, it’s not a matter of if blockchain will upend academic publishing – it’s a matter of when. The decentralization of academic publishing has the potential to hamper publishers who don’t innovate fast enough or introduce mechanisms of blockchain technology into their publishing processes.

In the thought leadership space, AIP could position itself as an authoritative source on best practices in utilizing blockchain for publishing and other related issues that might be relevant to our Member Societies. AIP could also act as an authority on blockchain publishing, providing insights on the submission and review process for physical science researchers. If AIP, and by extension our Member Societies and Affiliated Societies, are seen as trustworthy stewards of this new technology, that will inspire confidence in researchers, and could influence their decision to submit their work in one of our journals, and not a competitor.

**ii. Impact on broader community**

Blockchain promises to change the way that researchers interface with publishers. And while blockchain would still require a publisher, per se, the decentralized focus of blockchain publishing means that researchers are less reliant on a particular portfolio of journals for their area of expertise.

The ease and pace of blockchain means that new publishing competitors can enter the academic research landscape quite expediently, creating an even more crowded landscape, which could have negative impacts for existing journal’s revenue, impact factors, and more.

b. **Big Idea 2: Convening Relationships**
Because of AIP’s status as a federation – and our longstanding relationship with our Member Societies – we are in a natural position to act as a convener for our society partners and the private sector.

In a thought leadership context, AIP could commit itself to being more proactive in understanding the operational and functional needs of our societies, and acting as a partner to bring together resources from AIP, other societies and the private sector to offer solutions to the unique needs of a Member Society(s). If there were similar operational or functional challenges that were experienced by multiple societies, AIP could help bridge the communication gap between these societies and the private sector. For example, several Member Societies are dealing with issues of aging membership and difficulty engaging with early career scientists. AIP is working to bring these societies together to face these common issues, and can help bring industry into the discussion to ensure the strength and resilience of the STEM workforce.

i. Impact on MSs

This aspect of thought leadership, while not entirely imaginative, could have tremendous effects on the way our societies operate. When faced with an operational challenge, it’s typical for many organizations to diagnose a problem and come up with solutions form multiple different angles, which can require a substantial amount of human capital and labor. If a society were facing an operational challenge that has already been diagnosed or solved by a different society or outside organization, AIP could provide the access points between these entities, easing labor and administrative burdens. One way to entice participation from the private sector could be to give priority to Venture Partnership Fund grants that include a private sector component.

In another vein, AIP also could increase its capacity for knowledge transfer amongst our Member Societies and Affiliated Societies. For demonstration purposes, imagine if AIP modified or amplified its existing Assembly of Society Officers meeting, intentionally bringing in industry partners to talk about their relationship with societies. During such an event, programming can be exclusively focused on solutions-based workshops that help our societies navigate any challenges they might be facing and provide valuable insight and tools external from the association management space.

ii. Impact on broader community

If AIP were to incentivize a private-sector component to our Venture Partnership Fund, it could create new avenues for AIP and our Member Societies to engage with the private sector in a meaningful way. AIP could also commit itself to developing new platforms to spur collaboration or mentorship between our Member Societies and the private sector.

c. Big Idea 3: Cross-cutting Societal Issues

AIP can become a more prominent voice for the physical sciences community and provide position statements on topics that affect physical scientists across industries. This area of thought leadership follows a more traditional model of what is typically evoked when one thinks of “thought leadership.” A proof of concept for this model is AIP’s current TEAM-UP task force and its forthcoming report. TEAM-UP has brought together relevant voices to explore the underrepresentation of African Americans who pursue physics and astronomy bachelor’s degrees. If AIP and/or our Member Societies wanted to engage industry partners to explore
other areas of interest, such as pay disparity, environmental sustainability, or any other cross-cutting societal issue, AIP would be ready to lead with a model that works.

Similar to examining a larger issue of systematic underrepresentation and applying a focus that resonates with physical scientists, we can help provide guidance to the private sector on other topics while contributing to broader conversations of national importance. Our thought is that these conversations are already happening in the broader community regardless, and we believe that physical scientists, private sector and otherwise, should be involved in these conversations. AIP can act as a forum for these conversation amongst physical scientists, or even act as a convener that cuts across all industries where physical scientists might work.

There are numerous cross-cutting societal issues that directly or tangentially impact physical scientists across industries, and AIP can leverage its resources to examine these issues and provide actionable takeaways. Issue areas where AIP could begin immediately developing traditional thought leadership pieces include diversity, equity and inclusion; environmental sustainability; and career development.

i. Impact on MSs
   The most immediate impact for our Member Societies is cost. The broad societal issues that affect one of Member Societies will invariably touch aspects of another society; if multiple societies take up a similar cause, does it not make more sense to unify and combine our resources to work collaboratively? Utilizing our shared resources to unpack and explore these issues makes business sense, and can save all parties involved time and labor, increase collaboration, and strengthen inter-society relationships. Partnering to address these societal issues also increases the range and reach of our shared message.

   ii. Impact on broader community
      Having a more public-facing, unified voice for the physical sciences will provide more opportunity for entities in the private sector to sign onto or partner on initiatives they might not otherwise do independently. By engaging in this type of thought leadership, we are creating seats at the table to bring together a broad spectrum of physical scientists. And if AIP and our Member Societies were to collaboratively produce a report(s) that had ramifications for certain pockets of the physical sciences private sector, it could create inroads between our Member Societies and those private sector entities.

IV. Accomplishing them (How can we do it?)
   a. Accomplishing Idea 1: Disruptive Tools & Technology
      - Develop a task force (either internal or composed of representation from our Member Societies) to explore areas of concern, such as blockchain publishing
      - Invite private sector partners and/or subject-matter experts to speak with the task force
      - Define potential breadth and scope of disruptive tool/technology
      - Work with task force and Member Society representatives (where appropriate) to diagnose potential impact to operations
      - Draft report outlining findings for dissemination to our Member Societies and Affiliated Societies, or broadly to the physical sciences community

   b. Accomplishing Idea 2: Convening Relationships
• Actively incorporate private sector partners in the planning of events such as the Assembly of Society Officers
• Introduce the idea of weighting VPF awards with private sector partnerships to the Venture Partnership Fund Committee
• Work with Member Societies and Affiliated Societies to gauge interest in workshops, and larger event focused exclusively on needs and operations of these societies
• Develop programmatic task force to come up with educational/functional area tracks
• Put out call internally to AIP, MS/AS and private sector partners for session proposals
• Secure funding/space for event

c. **Accomplishing Idea 3: Cross-cutting Societal Issues**
   • Gauge interest (possibly via a survey of PT readership and other forums) to see what issues our community wants addressed with regard to the private sector
   • Catalogue internal (AIP) and external (MS/AS and private sector) resources that can be utilized to explore issue area
   • Prioritize issue areas for focus
   • Bring together private sector partners/subject matter experts
   • Develop plan of action/timeline for project
   • Produce report/findings/recommendations (similar in scope to TEAM-UP)

V. **Measuring Success**

a. **Measuring Idea 1: Disruptive Tools & Technology**
   Success for this first big idea is directly tied to our ability to help our societies adapt to these emerging technologies. Success could conversely be tied to whether Member Societies turn to AIP as a trusted facilitator or advisor on these topics. We would define success as doing everything in our capacity to make sure all are prepared to mitigate any substantial business disruptions or losses when and if a new technology emerges. Success also could be understood as continuously and systematically scanning the horizon for emerging tools and technologies. Success is somewhat abstract in this regard because absent any substantial interruptions (for example, if a society’s publishing operation absorbed critical revenue losses), it’s difficult to quantify success.

b. **Measuring Idea 2: Convening Relationships**
   Success could be directly linked to overall attendance at a larger event for our Member Societies and Affiliated Societies, and qualitative measures from attendees, specifically from private sector partners. Qualitative measures could include follow-up surveys after such an event to measure whether attendees felt the event was worthwhile, or if there are lessons learned from the event that the have applied in their professional life. Success wouldn’t have to be wholly determined during or immediately after the event. If societies reported that they were able to apply lessons learned from the event to improve their operations or functions during the course of the following months/year, that also could be considered a success.

c. **Measuring Idea 3: Cross-cutting Societal Issues**
   Having our collective materials cited in traditional media, trade publications, or other research. Is the private sector approaching AIP and wanting to collaborate on projects of mutual concern?
We also could define success as having a unified marketing campaign with private sector partners around a singular issue (such as climate change, diversity in STEM, etc.)

VI. Potential pitfalls & Solutions
   a. Potential Pitfall: When exploring AIP’s role in thought leadership, the white paper team thought about ways we could incorporate thought leadership as it applies both to our role as a federation and as an institute. One potential pitfall occurs from the federation perspective, when we try to think too broadly or incorporate too many individuals around the table. Our team thought quite broadly in terms of collaboration across societies and with private sector partners.

   That said, it is difficult to operate effectively across the scheduling constraints of several organizations that all have their own time commitments and programmatic focuses going on at any given time. This pitfall cuts across all three of our big ideas, since each have some aspect of cross-organization collaboration baked into them.

   Potential Solution: Limit project scope to only work on certain/predefined days of the week/month. See if common times arise for the majority of participants. Utilize asynchronous communication tools, such as Slack or Teams, to allow for maximum participation of all who would like to be involved.

   Potential Pitfall: Organizational ownership/confusion over ownership. If AIP were to partner on a larger thought leadership project with all or some of our Member Societies, the distribution of labor and credit could get murky. If Society A objectively puts in more work or resources than Society B, should Society A receive more credit on any type of finished product?

   Potential Solutions: Develop materials that can be packaged and distributed to each society’s membership showcasing the parent society’s branding and logo. Or have a clear hierarchy of branding inside materials that showcases all society branding/logos. Or develop a true federation branding and logo that highlights each society under a shared mantle of the physical sciences.

VII. Conclusion
   Thought leadership is an area that AIP should certainly explore as it builds out its strategic framework. There are multiple avenues AIP could take regarding thought leadership, but any new activities in this thought leadership space should be very deliberate. To help AIP measure its success, we should employ a combination of quantitative and qualitative metrics to any activities in this thought leadership space so that we can inform the development of our efforts. It should be noted that traditional metrics can only tell us so much about any activity’s success.

   Moving forward, AIP should be flexible enough to change direction, but thoughtful enough to be confident in where we fit within the larger landscape of the physical sciences. Any thought leadership activities should be examined from as many angles as possible to ensure we are providing practical value to physical scientists in the private sector, as well as to our Member Societies and Affiliated Societies. This exercise, while performed not explicitly for the purposes of programmatic implementation, provides us a glimpse of how AIP could begin carving out an identity in the thought leadership space.

VIII. Appendix
a. **Team Member Recognition**  
  Jonny Behrens (FYI)  
  Chip Calhoun (Niels Bohr Library & Archives)  
  Julius Dollison (Statistical Research Center)  
  Bonnie Feldman (Career Network)  
  Tonya Gary (Physics Today)  
  Frank Graeff (MS Relations)  
  Bo Hammer (MS Business Development)  
  Bethany Johns (Government Relations)  
  Kerry Kidwell-Slak (Society of Physics Students)  
  Laura Merner (Statistical Research Center)  
  Catherine Meyers (Inside Science)  
  Christine Middleton (Physics Today)  
  Melanie Mueller (Niels Bohr Library & Archives)  
  David Reinbold (Marketing & Communication)  
  Peter Reppert (Web Development)  
  Yuen Yiu (Inside Science)  

b. **Meeting Agendas**

**Agenda 1 – April 24, 2019**
Exploring thought leadership roles for AIP as a federation and as an institute, with respect to physical scientists in the private sector. To create a baseline understanding for the entire group, we want to do some background research that tease out these questions:

- What is already being done on this topic by AIP?
- What is already being done on this topic by our Member Societies?
- What is current scholarship/research on science and the private sector?

For the topics above consider the following questions:

- What does the landscape look like currently for physical scientists in the private sector?
- What audiences are being served or missed?
- How is AIP equipped (or not) to engage the private sector?
- Others?

**Agenda 2 – May 9, 2019**
Exploring thought leadership roles for AIP as a federation and as an institute, with respect to physical scientists in the private sector:

- How can AIP best leverage our resources and knowledge in the areas your group researched?
- What strengths or resources does AIP have that it could pivot to thought leadership?
- Are there gaps in what AIP can offer our Member Societies and/or the broader physical sciences community? If so, what are they?

**Agenda 3 – May 24, 2019**
Large group discussion to get everyone's ideas on the table and then do some prioritization to see where we want to focus our energies for the final paper.

To help organize thoughts, white paper leads brainstormed a few categories that ideas might fall into:

- Social Concerns (e.g., sexual harassment, climate change)
- Technology & Innovation (e.g., tech transfer, intellectual property)
- Knowledge Sharing & Dissemination (e.g., publishing, news, workshops and website)
- Workforce Pipeline (e.g., what will private sector need from personnel)
- Regulation & Policy (e.g., government relations, advocacy)
- Services (e.g., administering surveys)

**c. Resources**


d. **Other ideas considered**

**Ideas are coded by whether they are best served by AIP acting as an Institute (I) or Federation (F)**

**Social Concerns**

- Convening forums on topics like preventing sexual harassment, increasing inclusivity, gender equity, etc. (F)
- Global Warming: collecting publications, research, and meetings on how we tackle this as a community (F)
- Sustainable tech & disaster recovery – existential threats (F)
- Lead by example: accessible & multilingual web content where appropriate (I)
- Corporate/Social Responsibility Talking points or initiatives for Member Societies and private sector (F)

**Technology & Innovation**

- Help Member Societies with technology (F)
  - Blockchain
  - AI – assisted research
  - Open Source leader
- Seek out partnerships with startups and develop partnerships (F)

**Knowledge Sharing & Dissemination**

- Have Assembly of Society Officers session on industry linkages (F)
- Create new liaison committee for industry connections (F)
- Private Sector: Forecasting & surveys (I)
- Workshops with outside scholars using library materials (I)
AIP Private Sector White Paper Report

- Rise of Authoritarian capitalism: convene groups on what it means to “advance, promote and serve the physical sciences for the benefit of humanity” in that economic/political context (I)
- Educating private sector on what physical sciences can bring to their company (physics branding awareness) (I)
- Social network/forum for MS & industry to connect (F)
- Advocate/communicate impact of open source research (data, publications, tech). Work w/ MS to develop best practices & models (I)
- Investing more resources to expand online presence, perhaps full-time staff dedicated to creating multimedia content (I)

Workforce Pipeline
- Digital Badging of different competencies and skills used by physical scientists in industry (I, F)
- Partner with Member Societies to develop lists of potential industry partners (F)
- Providing scholarships/internships and hosting summer camps for K-12 students (I)
- Partner with minority organizations to develop K-12 strategies (F)
- Sponsoring a physics science prize for high school students. Private industry sponsor, AIP facilitate/promote. (I)
- Technology boot camp to bring in early career people and have industry train them in specific skills (I)
- Internship program for private sector companies (I)

Regulation & Policy
- Actively engage with DC groups working in industry (e.g., SSTI, ITIF, Task Force on American Innovation, Innovation Imperative, Business for Federal Research Funding) (I)
- Have public statements/official positions on science-related topics relevant to society that might/might not be political, e.g., climate change, nuclear power, etc. This could create a way to advocate for public policies consistent with our positions and we use that as a way to get public/private donations? (I)
- Be clear on what we intend to lead about: (I)
  - Workforce/workplace issues
  - Climate
  - Energy
  - Weapons
  - Budget/policy priorities
  - Tech Transfer
  - Science Education
- Communicate how startups/small companies are impacted by and can engage with agencies (SBIRs/funding, policy development/agency changes, larger trends) (I)
- Actively communicate and share FYI policy resources (budget, bills, etc) to govt affairs entities (@companies/industries/etc.) (I)
- Provide additional how-to guides for smaller Member Societies and Affiliated Societies on how to engage with lobbying/advocacy efforts (I)

Services
- Develop an industry relations committee (w/ participation from a diversity of private sector entities) to help guide initiatives/provide feedback. (F)
- Extend current offerings across media channels. In-house media production. (I)
• Hire new staff member focused solely on building industrial connections. (I)
• Offer headhunter/search firm capabilities (I)
• Give preference to VPFs that involve the private sector (F)
• Create new VPF-like award for MS-Private Sector links (F)
• Cultivate additional sponsors/donors for major events and initiatives (F)
• Offer special benefits for corporate job posters who post on PTJobs (F)
• Utilize existing SRC data on who hires physics grads to provide information on partnerships to universities. Creating a matching service of sorts. (I)
• Develop best practices guides for involving industry in meetings and career fairs (F)