Applications Physicist Job Family

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Motivation

- Why should the SAC be involved in the Applications Physicist job family?
- From the Scientist Advisory Council charge (emphasis added):

The charge to the council is to engage in open discussion on topics of interest for both short- and long-term plans for the laboratory's research program. ***The council also discusses issues related to careers and professional development of the Fermilab scientific staff.***

- The SAC was involved in the 2015 change to the Policy on Scientific Appointments that removed Applications Physicists.
- Focus on Scientific Inclusion at P5 and SAC

A moment on history

- In 2014, the SAC was charged with overhauling the Policy on Scientific Appointments, which covered Applications Physicists at the time.
- In Mike Lindgren's Jan 6, 2014 presentation to the SAC, he raised some interesting questions:

  - Should there be more clear distinctions between Board appointed scientists and Term/AP positions?
  - Are the number and types of positions adequate?
    - Should we have a term position of "project physicist?
    - Should we make a greater parallel between AP's and board scientists?
      - FT AP can be a first position – is that fair to the Term AS people?
      - Should there be a senior AP, or AP Manager position?

- (At the time, Scientists were appointed by the FRA board, and AP appointments were "made by the Director, who may request FCSA advice on the appointment.")

https://fermipoint.fnal.gov/org/ood/sac/Shared%20Documents/2014%20Files/01_2014_January%20SAC%20meeting%20files/SAC_01_06_2014_Fermilab_Scientist_Policy_Slides.pptx

More on history:

- In the February 2015 All-Scientists Meeting the result was: "Application physicist positions removed from policy"

Application Physicists

- Application physicist positions not included in policy
- Number of issues about positions
  - Positions not board appointed
  - Self directed research not normally undertaken
  - AP terminations not board approved
  - Only two levels (AP I and AP II) made the job not attractive as career option, limited growth potential
  - Other positions with many Ph.D. physicists (Comp Sci.) not mentioned
- WDRS working to create creation of 2 higher level Application Physicist classifications
  - Draft job descriptions written
  - Makes it a better, more attractive career path

https://indico.fnal.gov/event/9379/contributions/114240/attachments/74112/88943/Scientific_Appointment_All_Sci_ML_6Feb2015.pdf

A response to the 2015 policy

- Following the All-Scientists meeting, a group of APs sent the SAC a strongly worded letter refuting claims made during the meeting. The letter concluded, in part:
  - "If the community is determined to not include AP in Scientific Appointment Policy, the only just solution is to treat AP and Scientists on an equal footing and a priority basis, given their similar competencies and work scopes."
  - "The Fermilab environment has always thrived on an atmosphere wherein true team work was driven by individual talent, mutual respect and, not least, disregard for a person's title or work label. Demoting AP's to a support-only status is unwarranted when, in reality, many in the Scientist category effectively have similar supporting roles within their work activities."
- It is unclear if anything came of that.

Since Then:

- July 2015: Applications Physicist III and IV positions were added, respectively requiring line management and project management responsibilities.
- 2018: Scientist family positions given a ~20% higher pay scale. Applications Physicists left as they were.
- May 2024: Report to SAC about FCSA wrt/recent hires.
- New AP job postings are under “Engineering Physicists”
- As of April 16 the headcount in each level are:
  - **AP I 11**
  - **AP II 19**
  - **AP III 17**
  - **AP IV 1**
- (I can’t find any AP-IVs by searching in Fermiworks though.)

Fermilab Scientific Appointments Policy, Section I: Principles

- Personnel practices for scientific staff at Fermilab are based on the following principles:

a. Fermilab strives to attract and retain scientists of the highest quality, recognizing the laboratory mission of providing accelerators, experimental facilities, and technology that cannot be realized by individual universities, and acknowledging that the laboratory program encompasses activities beyond the laboratory site.

b. To ensure the excellence of the laboratory's present and future program, it is essential that members of the scientific staff be given the opportunity to engage in self-directed research in areas of science and technology related to laboratory programs.

c. Every member of the scientific staff is expected to contribute to the development and operation of the laboratory's program. Intellectual contributions in areas of science, technology development, and leadership all shall be equally valued to the mission of the laboratory.

d. Personnel practices will be uncomplicated and made known to all who are affected by them. They shall be applied fairly and consistently.

e. Fermilab strives to compete effectively with peer institutions in attracting and retaining scientific staff. The ranks of Fermilab scientists should stand in clear correspondence to professorial ranks in universities. Continuing appointments, in accordance with these policies, are essential to ensure the laboratory's competitiveness.

f. It is the policy of Fermilab to pursue its scientific goals with an emphasis on equal employment opportunity and a special dedication to human rights, diversity, and dignity.

A: Quality | B: Research | C: Variety | D: Transparency | E: Competitiveness | F: Equality

The state of Applications Physicists: Starting

- Applications Physicist positions are listed under “Engineering Physicist” on the careers page, rather than Scientist.
- Applications Physicist-I has the following requirements:
  - Minimum of 4+ years post PhD. Appointment may be for a term or an indefinite period; appointees will usually possess a Ph.D. or equivalent. Term appointees will usually have completed at least one term as Research Associate; indefinite appointees will usually have completed one or two terms as a Research Associate or one term as an Associate Scientist, or have equivalent experience.
- Despite requiring Research Associate experience, the pay scale for AP-I (A-3/4) and Research Associate (S-1) are nearly identical.
- In fact, the requirements for Associate Scientist (S-2) are even more lax:
  - Appointees will usually possess a PhD have recently completed their PhD and have completed at least one term as a Research Associate (or an equivalent level of academic training/experience).

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The state of Applications Physicists: Starting

- Comparing to the 2021 job family review for CS families, AP-I would fall in an unexpected part of the chart:

3. Standardize CS education/experience requirements

		< Bach	Bach	Master	PhD
A9	Tracks	17+	15+	13+	11+
A8	Tracks	12+	10+	8+	6+
A7	Senior	8+	6+	4+	2+
A6	Staff	5+	3+	1+	
A5	Staff	3+	1+		
A4	Entry/ Staff	2+			
A3	Entry	Experience may not be required			
A2	Entry				

AP-I: 4+

1. Based on current requirements and reviewed against market
2. Reviewed by Job Family teams for approval
3. Applied with flexibility
4. All job descriptions will include education and experience requirements

https://fermipoint.fnal.gov/org/wdrs/doclibraryhr/Computing%20All%20Hands.pdf

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The state of Applications Physicists: Early Career

- The experience requirements for AP-II is only 2 additional years past PhD than for AP-I, and the job description isn't meaningfully different.
- Why are about a quarter of APs at level I?
  - Possible reasons:
    - Roles in projects are often filled through matrixing rather than a competitive hiring process. Reducing opportunities for promotion.
      - See Fermilab LRG Equity Recommendations 2020
    - Many APs aren't supervised by other APs: without the framework of the Engineering Promotion Committee, FCSA, or recommendations from HR, without a lab-wide promotion policy, some may slip through the cracks.
    - The AP-III and AP-IV levels are *relatively new,* so there remains a backlog of promotions due to many senior APs having been stuck at AP-II for much of their careers.

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The state of Applications Physicists: Early Career

- Applications Physicists are not granted a set aside fraction of their time for self-directed research as a matter of course. Some may request it, but the availability varies across the lab, and it anecdotally seems rare.
- LDRD and Instrumentation funding is very limited relative to the demand, but (again anecdotally) Applications Physicists are very likely to apply anyway, and to conduct research in the course of their job duties.
- At the same time, the lab encourages all eligible employees to apply for DOE Early Career awards.
- Without an ongoing research effort, starting an ECA proposal, iterating on it, and demonstrating potential for leadership are exceedingly difficult.

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The state of Applications Physicists: Mid-Career

- Since 2015, there is now an Applications Physicist-III level.
- The ranks of AP-IIIs have increased by 50% over the last two years, since I've been keeping track. Great!
- Unlike Scientist, Engineering and CS job families, and despite "Principle C", AP-III specifically **requires line management responsibilities.** Technical excellence just doesn't cut it.
- Similar impediments to promotion exist at this level.

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The state of Applications Physicists: Mid-Career

- There might be one AP-IV at the lab, despite the Applications Physicist job family having existed for several decades.
  - AP-IV has similar requirements to Senior Scientist, which do exist.
- Unlike Scientist, Engineering and CS job families, and despite "Principle C", AP-IV specifically lists:
  - **"Responsibilities include assignment of a Project Manager role."**
- They also must "…have completed more than 7 years as an Applications Physicist III, or equivalent experience."
  - "Years in previous level" experience requirements perpetuate past delays in promotions, both for individual employees and across a job family and don't reflect an actual lack of experience obtained.
- While there may be distinguished Applications Physicists, there is no Distinguished Application Physicist position to aspire to.

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Relationship to the Scientist job family

- Applications Physicist and Scientists have generally completed a PhD in physics and time as a research associate.
- The Applications Physicist job family has grown from the advantage of not requiring FRA board, or FCSA involvement for the initial appointment.
  - That difference has been significantly, or almost entirely removed.
- The pay scale for the Scientist family is uniformly higher than that for Applications Physicist.
- There seems to be a general agreement that Scientist family positions are a promotion over the Applications Physicist positions.
- The job descriptions and practical responsibilities for APs and Scientists overlap.
- Scientist and Senior Scientist positions are generally filled through promotion or targeted hire and are not posted for applications.
- Without a bright line difference in these job families, nor a formal path for promotion, nor competitive job posting, how can an individual make an argument for promotion to a Scientist family position?

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Some Questions and the Path Forward

- Prior to the 2015 revision, these six Principles (with slightly more general wording) applied to Scientist and Applications Physicists alike:
  Quality, Research, Variety, Transparency, Competitiveness, Equality
- How has the removal of the AP family advanced those principles for these groups:
  - Individual Applications Physicists and the job family
  - The Scientist job family
  - Fermilab: the laboratory mission and community
- Are we satisfied with how the status quo aligns with our objectives and principles as a scientific community?
- Are we satisfied that we can justify this structure as the best structure moving forward?

Backup slides

Policy deliberations November 2014

Scientific Positions -

- Application physicists no longer “Scientific Staff”
  - AP’s were never board appointed
  - AP’s never had research fraction
  - AP’s never had the employment protection of scientists
  - AP I and AP II made the job not attractive as career option, limited growth potential
    - Propose creation of 1-2 higher level classifications – Senior AP or AP manager, for example
    - Make it a reasonable career path for physicists who will not be scientists
- There was a minority opinion in the steering group
  - Felt AP appointments should be considered by FCSA
  - Majority felt the policy was better if it did not include AP’s
    - Transition to scientist still possible
    - More even footing in employment for outside candidates vis-à-vis FCSA
- Applied Scientists reclassified as Scientists at same level
  - Roles and responsibilities, salary structure, etc., were almost identical
  - Difference was very small
    - Lab has scientists that focus on technology – are they misclassified?
    - Distinction seemed “accidental” in many cases

https://fermipoint.fnal.gov/org/ood/sac/Shared%20Documents/2014%20Files/11_2014_November%20SAC%20meeting%20files/SAC_Scientific_Appointments_ML_17Nov2014.pptx.pdf

Pre 2015 Scientific Appointments Policy Principles

- Personnel practices for scientific staff at Fermilab are based on the following principles:
- (a) Fermilab was built as a national laboratory and is intended primarily for the use of visiting scientists. Every member of the scientific staff at Fermilab is expected to contribute to the development and operation of the Laboratory.
- (b) In order to ensure that Fermilab's program is of the highest quality, it is essential that members of the scientific staff, as noted in Section IV, be given the opportunity to engage in self-directed research in areas of science related to the Laboratory programs.
- (c) Intellectual contributions in areas of physics related to the Laboratory programs, technology related to the Laboratory programs, and leadership, shall be recognized on an equal footing.
- (d) Personnel practices shall be uncomplicated and made known to all who are affected by them. They shall be applied fairly and uniformly.
- (e) Fermilab will strive to remain competitive with other similar institutions in attracting and retaining qualified scientific staff members.
- (f) It is the policy of Fermilab to pursue its scientific goals with an emphasis on equal employment opportunity and a special dedication to human rights, diversity, and dignity.