Enhancing Postdoctoral Fellowship Experiences:

An evaluative study of the Postdoctoral Fellows program at the Kavli Institute for Cosmological Physics at the University of Chicago

A report for

By

Rockman et al
Independent · Insightful · Informative
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EXECUTIVE SUMMARY

A mixed methods evaluation was conducted on behalf of the Kavli Institute for Cosmological Physics at the University of Chicago by the external research and evaluation firm, Rockman et al. Through a series of surveys, interviews, and focus groups, the evaluators sought to identify unique strengths of the program—especially those that may set it apart from other prestigious fellowships—and to better understand short and longer-term impacts of serving as a KICP Postdoctoral Fellow. The evaluation also sought to identify specific recommendations for programmatic improvement, as well as a more general set of best practices for postdoctoral program success.

The KICP Postdoctoral Fellowship provides a select group of exceptional scholars an opportunity to apply their talents and knowledge to research of their choosing. Unlike standard postdoctoral appointments—but similar to other prestigious fellowships—KICP Postdoctoral Fellows are not assigned to one faculty member, team, or project. Instead, Fellows have the freedom to choose where and how they devote their time—however, there sees to be a consensus among current and former Fellows that theorists are in a better position to take advantage of the freedom and flexibility afforded by a fellowship than experimentalists, due to the logistical constraints associated with experimentation (i.e., high costs for equipment and project timelines that stretch beyond the average length of a postdoctoral appointment). This finding is not isolated to the KICP Postdoctoral Fellowship and concerns about limitations to research freedom for fellows doing experimental work were also expressed by non-KICP fellows who participated in a small comparison group study that was included as part of this evaluation.

Would-be Fellows often have a choice of several postdoctoral appointments and prestigious fellowships. When making their postdoctoral program selections, Fellows consider specific research opportunities, look for a good cultural fit, and consider the long-term career advantages that one fellowship opportunity may present in comparison to others. The notoriety of the Cosmological Physics program and the fact that so many world-renowned faculty members are affiliated with the University of Chicago are both attractive features of the KICP Postdoctoral Fellowship program. KICP Postdoctoral Fellows also acknowledge the unique nature of KICP and the subsequent advantages of having so much Cosmology research and so many leading scholars housed under one roof.

Most KICP Postdoctoral Fellows had positive experiences during their fellowship. In contrast to other fellowship experiences some have had or have heard of, KICP Postdoctoral Fellows express gratitude that KICP offers a collaborative environment wherein they feel that everyone is approachable. They also appreciate the full slate of activities offered by KICP, including regular opportunities to hear talks and presentations from leading scholars from all over the world. In addition to attending events, Fellows have the opportunity to invite speakers and organize conferences themselves. They note that these experiences help them build and strengthen their professional networks and help them prepare and feel more confident about the next stage of their career.
As newly minted PhDs, Fellows are no longer students, but not yet faculty. In contrast to programs where Fellows have few or no peers in a similar position, KICP Postdoctoral Fellows appreciate having a small group of other Postdoctoral Fellows with whom they can interact and occasionally partner on research projects and publications. Having a cohort of Postdoctoral Fellows was therefore noted as a somewhat unique and appreciated feature of the KICP Postdoctoral Fellowship program.

Fellows indicate that they know what is required of them in order to be considered successful and in order to stay on track for a faculty position. However, some still express a desire for feedback and a need for support and guidance from time to time. Most Fellows indicated that they had been successful in their efforts to establish a positive mentorship relationship with one or more faculty member during their time at the University of Chicago. Nearly all Fellows, however, see value in the newly launched Career Mentor program that seeks to proactively partner Fellows with faculty members who are outside of their primary research area, with the goal of providing broader feedback and advice related to a fellows’ long-term career trajectory and interim decisions that may have subsequent implications on that trajectory. Findings indicate that faculty members also value opportunities to mentor bright young scholars and anticipate that their experiences serving as career mentors will have a positive impact on their research-related mentorship experiences as well.

Fellows indicate that a strong network and a robust list of contacts within their field is one of the most important outcomes of the KICP Postdoctoral Fellowship experience. Another outcome of note is the fact that, despite a very competitive job market in recent years, 79% of former fellows for whom current employment data was available (i.e., 56 of 59) have gone on to careers in academia. Equally as important as where former Fellows are employed is the fact that nearly all current and former fellows (i.e., 98%) of those who complete the KICP Postdoctoral Fellowship Survey (n=50) indicate satisfaction with their current career and the overall career path they’ve taken thus far. Furthermore, a great number feel that the experiences they had and contacts they made while serving as a KICP Postdoctoral Fellow had a positive impact on their subsequent success.

The Kavli Institute for Cosmological Physics has the unique advantage of bringing together many different types of researchers and strands of Cosmological research in one site. As such, there is arguably a greater ability on the part of Fellows to develop a broader perspective on the field and greater opportunities to pursue interdisciplinary projects. Not surprisingly, fellows who joined research groups outside of their primary research areas were significantly more likely to indicate development of an interdisciplinary approach to research and having broader research interests.

In addition to the benefits that KICP Postdoctoral Fellows realize as an outcome of their involvement with the program, there is no doubt that the Fellows have a positive impact on the KICP as well. Not only do they make great contributions to ongoing research projects, the Fellows also help to facilitate and ensure communication across research groups. The practice of hiring brilliant people, providing a lively and engaging research environment, and giving them the freedom to align themselves with collaborators and projects that they are most inspired by and feel best-suited to contribute to ultimately helps to keep KICP on the cutting edge of Cosmological research.
METHODOLOGY

To answer the questions set forth for this evaluative effort, both qualitative and quantitative methodologies were employed by Rockman et al, the independent evaluation team that spearheaded this study.

**Current Fellows Focus Group:** Rockman et al facilitated a focus group with current participants in the Postdoctoral Fellows program. The focus group protocol was designed to elicit a wide range of responses as well as determine areas where there is consensus among participants about program strengths, weaknesses, benefits, and projected outcomes.

**Past and Current Fellows Survey:** An online survey invitation was sent to all KICP Postdoctoral Fellows (past and present). In addition to having respondents rate the importance of various elements of their postdoctoral experience at the University of Chicago, the survey also sought to determine the perceived impact of the KICP postdoctoral experience. A total of 59 survey invitations were sent to current and former fellows via email and LinkedIn; there was an 85% response rate (i.e., 50 of 59 fellows completed the survey).

**Past and current Fellows Interviews:** In-depth interviews were conducted with ten former KICP Postdoctoral Fellows and two current Fellows who were not able to participate in the focus group. Each interview covered former fellows’ experiences during the postdoctoral experience at KICP and perceived outcomes of participation in the program including the extent to which they feel subsequent professional successes and strengths are, or may be, due to their experiences in the KICP Postdoctoral program.

**Comparison Group Study:** The study also included a comparative study of outcomes for Postdoctoral Fellows who accepted the appointment at the University of Chicago in contrast to those who turned down an offer to participate in the program. Eight individuals were identified as members of a potential comparison group; all were contacted, and three ultimately agreed to participate in an interview about their postdoctoral experiences.

**Faculty Member Survey:** To more fully understand the experience of faculty members serving in both formal capacities as appointed “Career Mentors” for Postdoctoral Fellows and informally as research collaborators and advisors Rockman et al administered a short survey to all KICP faculty members. The survey contained a mix of open-ended and closed-ended response options and in addition to better understanding mentorship experiences, the survey was also designed to elicit additional thoughts on the added value of a postdoctoral fellowship experience such as the one offered by KICP.
FINDINGS

Fellows-Survey Respondent Demographics

Years of Participation
Past and current fellows were invited to provide feedback about their postdoctoral fellowship experiences both at KICP, and if applicable, elsewhere. Within the 50 survey responses submitted, there was a balanced mix of fellows from different eras of the program (i.e., 12 who started from 2001-2003, 12 who started from 2004-2006, 9 who started from 2007-2009, 9 who started from 2010-2012, and 8 current fellows who started their KICP postdoctoral fellowship between 2013 and 2015). Former fellows who were interviewed also represented a range of years of participation in the program.

Awards and Recognition
KICP Postdoctoral Fellows are exceptional scholars and researchers. They have come from the leading Physics and Astronomy programs around the world. They have contributed to studies that have led to Nobel Prizes and have been award recipients themselves including NSF CAREER and PCASE awards, DOE Early Career Awards, the APS Young Star Award, the Bok Prize, and the “Women in Science” Award.

Additional Postdoctoral Appointments
More often than not, the KICP postdoctoral fellowship experience was accompanied by another postdoctoral appointment, either before, after, or in a few cases concurrently, with the KICP appointment. This is important to note in part because it suggests that the KICP experience is part of a larger post-graduate educational and career-building experience but also insofar as it suggests fellows’ ability to compare and contrast their KICP postdoctoral experience to other postdoctoral experiences. About a third (i.e., 28%) of survey respondents reported doing another fellowship prior to the KICP postdoctoral fellowship, and about half of those who had completed their fellowship (i.e. 48%) reported getting an additional fellowship after finishing at KICP. Other fellowships and postdoctoral appointments also held by KICP fellows include:

- The Einstein Fellowship
- The Spitzer Fellowship
- The Hubble Fellowship
- The Sloan Research Fellowship
- The John Bahcall Postdoctoral Fellow
- The McCormick Fellowship
- The Packard Fellowship
- THE NSF Astronomy and Astrophysics Postdoctoral Fellowship
Why Fellows Chose KICP

Research suggests that emerging scientists place great importance on the process of applying for and selecting fellowships as part of their ongoing career development process. Part of this study therefore sought to understand the relative importance of several different factors in the fellowship application and acceptance decision-making process. Survey respondents were asked to indicate how important each of several factors were in leading them to accept the position offered at KICP using a 5 point response scale, where 0=Not important at all, 1=Not very important, 2=Somewhat important, 3=Very Important, and 4=Extremely important. The following figure summarizes the average responses among all respondents for each factor they were asked to rate in terms of importance.

**Figure 1: Relative Importance of Decision-Making Factors for Accepting the KICP Postdoctoral Fellowship**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength of the program in general</td>
<td>3.38</td>
</tr>
<tr>
<td>Specific faculty members</td>
<td>3.30</td>
</tr>
<tr>
<td>Freedom/flexibility to pursue personal research interests</td>
<td>3.20</td>
</tr>
<tr>
<td>Prominence/reputation of a specific type of research</td>
<td>3.14</td>
</tr>
<tr>
<td>Prestige associated with the fellowship</td>
<td>2.56</td>
</tr>
<tr>
<td>Level of funding</td>
<td>2.16</td>
</tr>
</tbody>
</table>

Strength of the program and faculty were leading factors in fellowship selection

The reputation of KICP and that of specific faculty members were leading factors in Fellow’s decision-making process. Not surprisingly, research interests (i.e., freedom and flexibility to pursue personal research interests, and the prominence of specific types of research being done at KICP) were also cited frequently among the factors that were most influential in leading Fellows to accept the offer from KICP. While KICP Postdoctoral Fellows did find the fellowship to be prestigious, they had often applied for, and were considering several comparably prestigious fellowships.

“There was a uniform indication that I would have freedom to control my own research path, which of course was true and was the major driver in my decision.”
Selecting from among multiple fellowships

To maximize postdoctoral research options, Fellows tended to apply for multiple fellowships—in fact, there was only one survey respondent who indicated that the KICP Postdoctoral Fellowship was the only program to which he had applied. Sixty-two percent of survey respondents indicated that the KICP Postdoctoral Fellowship was their top choice among the fellowships they had applied for; 40% indicated that it was their best offer, and a small percentage (i.e., 18%) said that it was the only fellowship they were offered. These findings suggest that the majority of KICP Postdoctoral Fellows selected that appointment over other competitive fellowship offers.

The increasing importance of funding

When survey data were broken down by cohorts based on the years they had started as a KICP Postdoctoral Fellow\(^1\), analysis revealed significant differences in the importance of funding as a factor in the decision-making process has been increasing overtime, such that those in the most recent cohorts placed a higher value on the level of funding than their predecessors in earlier cohorts.\(^2\) The figure below shows a distribution of responses and the average response “score” within each cohort.

![Figure 2: Importance of "Level of Funding" by Cohorts, Over Time](image)

We also found a significant effect for the importance of the level of funding based on current employment status, when comparing the ratings among those currently in academic fields, those in research oriented positions outside of academia, those still/currently in a postdoctoral position, and those in fields outside of academia and research.\(^3\) The following figure displays the distribution of responses by current employment status.

\(^1\) Five cohorts were established based on the year respondents started their KICP Postdoctoral Fellowship: 1) 2001-20013, 2) 2004-2006, 3) 2007-2009, 4) 2010-2012 and 5) 2013-2015. Most, though not all, Fellows in fifth cohort were still completing their KICP Postdoctoral Fellowship.

\(^2\) Significant difference in responses across cohorts regarding importance of funding when deciding to apply/enroll in KICP, \(\chi^2(12) = 24.03, p < .05.\)

\(^3\) Significant differences found in the reported importance of level of funding as an application/selection factor among respondents based on current employment status, \(\chi^2 = 21.21, p < .05.\)
Flexibility

Coming to realize the freedom and flexibility to explore and pursue new research opportunities was also frequently mentioned by fellows as an attractive feature of the KICP postdoctoral fellowship program that they knew about prior to applying or learned about when interviewing for the position. Many Fellows noted that this type of flexibility is a common—and appreciated—feature of other prestigious fellowships. Despite knowing they would have the freedom to pursue whatever research opportunities most interested them, most Fellows also reported having some understanding of who they would be working with and/or what types of research projects they would be working on before they accepted the position.

Longer-Term Career Advantages

Long-term career interests also played a role in Fellows’ decisions to accept the position. Being able to get a leg-up on later academic appointments—especially in a very competitive job market—factored prominently into Fellows’ decision-making process. Several of the current Fellows mentioned being positively motivated by specific statistics about how many past KICP Postdoctoral Fellows had gone on to obtain faculty positions.

Impact of Campus Visit

Campus visits provided Fellows with an opportunity to gain first-hand knowledge about the program. Just over half of the survey respondents (i.e., 51%) indicated that they had visited the campus prior to accepting the KICP Postdoctoral Fellowship. Among those who reported having a chance to visit the campus prior to applying for and/or accepting the KICP Postdoctoral Fellowship appointment, Fellows reported the value of being able to meet and interact with different researchers (especially potential mentors) and research groups. Campus visits also allowed would-be Fellows to develop a sense of familiarity with the atmosphere within KICP and determine that it would be an environment within which they would be comfortable working.

“I very much enjoyed the people I met. I thought it was an exciting place to be.”

“The supportive atmosphere at Chicago is what convinced me to come to KICP.”

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**Figure 3: Importance of "Level of Funding" by Current Employment Status**

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Not very</th>
<th>Somewhat</th>
<th>Very</th>
<th>Extremely</th>
<th>Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>5</td>
<td>15</td>
<td>7</td>
<td></td>
<td></td>
<td>2.07</td>
</tr>
<tr>
<td>Non-Academic/Research</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>1.50</td>
</tr>
<tr>
<td>Postdoctoral</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td></td>
<td>1.50</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>3.00</td>
</tr>
</tbody>
</table>
KICP Postdoctoral Fellowship Experiences

As with any educational or employment opportunity, the resulting experience of being a KICP Postdoctoral Fellow was similar in many ways, but also varied to some extent from person to person. Differences in the personal preferences and characteristics of the Fellows themselves seemed to have a significant effect on the fellowship experiences. Similarly, there were marked differences based on Fellows’ specific research background and interests. As interviews progressed, the evaluation team noted different patterns of responses among Fellows who were engaged with experimental and/or observational work, in contrast to those whose work was more focused on theory.

Freedom and Flexibility
The flexibility that the KICP program affords its fellows in terms of their work was frequently cited as an important aspect of the KICP Postdoctoral Fellowship experience—similar to other comparably prestigious fellowships, but unique in comparison to other postdoctoral appointments. Generally speaking, Fellows appreciate having their own funding rather than having their funding tied to a particular faculty member or research project. This freedom contributed to a relatively stress-free environment for fellows to stretch their proverbial research wings, and better prepare for the next stage of their career—presumably one in which they would have more research autonomy as well. However, the Fellows also noted some potential risks and drawbacks associated with this freedom and also pointed out some of the logistical limitations to that freedom. These “pros” and “cons” are summarized briefly in the following table and discussed further below.

Table 1: Pros and Cons of Having Research Freedom and Flexibility

<table>
<thead>
<tr>
<th></th>
<th>Pros of Research Freedom</th>
<th>Cons of Research Freedom</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Fewer conflicts between team/lab’s best interest and one’s personal career-welfare</td>
<td>• Some oversight is good</td>
</tr>
<tr>
<td></td>
<td>• Good practice for being a professor - having to determine your own research agenda</td>
<td>• Don’t have a “boss” looking out for you and your welfare</td>
</tr>
<tr>
<td></td>
<td>• More control over your own destiny</td>
<td>• Need for a faculty member who knows your work well enough to write you a recommendation letter</td>
</tr>
<tr>
<td>Theorists</td>
<td>• Theorists thrive in environments where they have intellectual stimulation</td>
<td>• Risk of isolation – have to proactively seek partnerships</td>
</tr>
<tr>
<td>Experimentalists</td>
<td></td>
<td>• Limitations due to costs associated with running experiments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• May feel like there is a direction you are expected to go</td>
</tr>
</tbody>
</table>
A closer look at the positive side of having research freedom and flexibility

Fellows note that an opportunity to set one’s own research agenda is good practice for the next stage of their career, i.e., when as faculty members they will be solely responsible for deciding where to focus their research efforts. In addition to the opportunity to develop new skills in managing one’s research agenda in a relatively low-stress environment (i.e., one where it is okay to have some miss-steps), and to develop more maturity as a researcher, the Fellows also cited the intellectual stimulation associated with being able to chart one’s own course. In contrast to the standard or typical postdoc experience wherein a postdoc is required to work for one faculty member or research group, having research freedom affords a young researcher much greater control over his or her career trajectory. This control is both validating and also provides Fellows with more agency to act in their own best interest, whereas with typical postdoctoral appointments “the things you may be asked or required to do may not align with personal scientific interests and being able to do the things that will help to propel your career may not necessarily be a priority.”

Challenges and strategies for dealing with some of the potential drawbacks to research freedom

In contrast to the liberated feeling that can come from having complete freedom to pursue one’s own research interests, Fellows also noted the potential challenge of not knowing where to focus one’s research attention. Having to take complete ownership of their research agenda is often a novel experience for new fellows—one that can either be exhilarating or frightening. “People that come out of a PhD program will inevitably find the process scary...because you have to stand up for yourself, defend your science, and come up with your own ideas.” One former Fellow described this as a sink or swim moment; ultimately a thrill for those who manage to swim, but she cautioned that there is always a chance that those who lack maturity or the right mindset for this type of independence may sink. Another former Fellow suggested that it can be “frightening to be responsible for your own research program,” and described it as being a different experience than graduate school insofar as “you are really given that freedom and choice to prioritize...deciding what to do – with more freedom, there are more mistakes to be made.” He notes that it is often up to each individual Fellow to strike the right balance between producing “a lot in one area versus being more diverse,” and notes that the latter may come at the cost of diminished productivity due to the learning curve involved when tackling new types of research.

“If you work by yourself, it will not help you get a job. Independence is fine, but if no one knows you well, you’re not going to make it far.”

To combat the potential challenges associated with independence, Fellows noted the importance of being proactive in seeking mentors and advocates. Most of the Fellows understood that they needed to work closely enough with one or more faculty members to secure a recommendation letter, but they cited other benefits of mentorship as well. Fellows appreciated the diversity of faculty members with
whom they could potentially work, and felt that most were genuinely open to doing so. The Fellows also praised the willingness of faculty mentors to provide guidance and honest feedback related to their research or their careers in general.

Despite the clear advantages of mentorship, for some Fellows, aligning themselves with a specific faculty member or research group was not merely a strategic choice; it was a logistical necessity. Both theorists and experimentalists were quick to point out that doing advanced experimental work often requires costly equipment. As such, experimentalists, as well as those doing certain types of observational work, could feel locked-in to a specific project or research trajectory based on their skills and interests. Each of the Fellows knew they had the freedom to set their own research agenda while serving as a KICP Postdoctoral Fellow, however some felt they had a greater ability to exercise that freedom than others. Thankfully, they noted, because KICP is so well-funded “its easy to find experiments to work on.” While some experimentalists felt locked-in once they had selected a project to work on, i.e., unable to switch to new or different research projects, others indicated that they had done so successfully, with the full support of their KICP colleagues. Whether sticking with one research group or branching out, Fellows generally advised that experimentalists be proactive in carving out their own niche or seeking to put their own spin on group research efforts so that their unique efforts and scientific contributions could better standout.

“I was so excited to have the opportunity to follow my interests instead of being pigeonholed into the same research I did for my PhD forever.”

Theorists, on the other hand can “sprinkle” themselves over a number of different projects. Despite having more flexibility, it is still important for theorists to “define a unique brand” though the work they elect to do and the people with whom they ultimately form research partnerships.

Expanding Research Experiences
In addition to providing Fellows with the funding and freedom to set their own research agenda, the KICP Postdoctoral Fellowship program also offers Fellows a chance to expand their research horizons. Fellows were generally aware of KICP’s goal of fostering greater research diversity and interdisciplinary pursuits within the field of Cosmology and felt that they benefited from the associated opportunities that come along with working in a center devoted to this mission, including the opportunity to attend a wide variety of talks and presentations. The following figure summarizes the frequency with which the fellows who responded to our survey indicated they participated in each type of activity.4

4 Responses were coded as follows: “never”=1, “occasionally”= 2, “often”= 3, and “always”= 4.
Not surprisingly, the topic of talks and presentations had an important impact on the reported frequency of participation such that fellows reported attending related events far more frequently. In the figure above, note the high number of survey respondents (i.e., 64%) who indicated that they “always” attended events on topics that related to their work. It is also important to note that there was a similarly high number/percentage (i.e., 68%) of survey respondents who said that they attended talks and presentations on topics that were not directly related to their primary research areas.

While Fellows typically found great value in the frequent talks and presentations occurring on a regular basis at KICP, they also acknowledged the importance of striking a balance between their own research interests and exploring broader interests. They placed great value on the rich line-up of talks and events but appreciate being able to pick and choose which events they attend, without feeling pressure to attend them all.

Even in instances where presentations did not perfectly align with personal research interests or agendas, Fellows tended to find value in the opportunity to be exposed to a broader range of topics within the field of Cosmology and felt that they benefited from being exposed to research and findings that could have an impact on their own work. Likewise, they appreciated opportunities to contribute by sharing their own knowledge and methodological expertise with others.

The figure below summarizes survey results for a question that asked Fellows to indicate how often they participated in activities and events that were directly related to their primary research area, as

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*Figure 4: Frequency of Participation in KICP Events and Activities*

<table>
<thead>
<tr>
<th>Event</th>
<th>Never</th>
<th>Occasionally</th>
<th>Often</th>
<th>Always</th>
<th>Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday Lunch Seminar</td>
<td>6</td>
<td>23</td>
<td>20</td>
<td></td>
<td>3.29</td>
</tr>
<tr>
<td>KICP Colloquium</td>
<td>3</td>
<td>25</td>
<td>21</td>
<td></td>
<td>3.37</td>
</tr>
<tr>
<td>Topical Workshops</td>
<td>2</td>
<td>25</td>
<td>20</td>
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<td>2.45</td>
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<tr>
<td>Colloquia</td>
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<tr>
<td>Symposia</td>
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<td>16</td>
<td>11</td>
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</tr>
<tr>
<td>Talks</td>
<td>13</td>
<td>32</td>
<td>4</td>
<td></td>
<td>2.82</td>
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<tr>
<td>Outreach Activities</td>
<td>13</td>
<td>24</td>
<td>12</td>
<td></td>
<td>1.98</td>
</tr>
</tbody>
</table>
well as activities and events that were not directly related to their primary research area (labeled as “unrelated” in the figure below, though technically they could be marginally related).⁵

For theorists, the ability to attend a wide variety of presentations and various lab group meetings provided optimal opportunities to form new collaborations. Moving from group to group and project to project seemed to be most common among theorists, who appreciated the value of working in an environment such as KICP with so many talented people and so many interesting projects. Experimentalists, on the other hand, often expressed comfort and interest in attending different lab meetings but tended to stay primarily focused on a specific project or with a specific research group.

Attending lectures, presentations, or lab meetings that are not directly related to one’s own research is arguably an important first-step in gaining a broader perspective on the field of Cosmology. This study also explored the extent to which Fellows took the next step in becoming more actively involved in research outside of their primary area of focus. Ultimately, half of the fellows who responded to the survey (i.e., 50%) indicated that they had joined a team or contributed to a project that was outside of what they would consider to be their primary research area.

Advantages of a Larger Postdoctoral Cohort

As mentioned above, one of the potential drawbacks to the standard postdoctoral experience may be isolation from a cohort of scholars who are at similar points in their postgraduate careers. At KICP there are two to four new Fellows each year...in other programs there is only one...you don’t have a cohort,” explained one of the Fellows. Being a part of a larger postdoctoral cohort is helpful because “faculty and Grad students aren’t in the same boat...their missions are different,” noted one Fellow while expressing his appreciation for being able to get to know and work with several other people who were also postdocs at the University of Chicago. “The first

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⁵ Responses were coded as follows: “never”=1, “occasionally”= 2, “often”= 3, and “always”= 4.
postdoc is an awful time for everybody, in grad school you learn how to solve specific problems but you don’t learn how to be a good post doc,” stated a postdoc who also found great value in having other Fellows with whom to commiserate, develop a greater sense of comfort for postdoctoral life, and collaboratively seek to foster higher levels of confidence within one’s postdoctoral cohort.

In addition to finding comfort in being among a cohort of other postdocs, the former Fellows with whom we spoke also cited examples of specific research partnerships they were able to form with other fellows as well as new interests or skills they were able to develop with help from their KICP Postdoctoral Fellowship colleagues. While it can most certainly be seen as advantageous to work with the leading faculty members in one’s field, there are also unique advantages for postdocs to be able to work together on projects with other postdocs. Inter-postdoctoral publication partnerships, for example, can help to ensure that the unique research perspective and voice of each author will be heard more clearly than they might otherwise be if part of a much larger or well-established research group.

While similar in some ways to other postdoctoral fellowship experiences, the KICP Postdoctoral Fellowship program offers opportunities and experiences that may be considered more unique. Among these are the ability to host talks and organize conferences—with robust support from KICP, the International Fellows Exchange Program, and an exceptionally strong Outreach Program.

**Experiences Hosting Talks and Organizing Conferences**

In addition to attending talks, colloquia, symposia, conferences, and workshops hosted by KICP, Fellows are also invited to invite their own guests (via the KICP Visitors Program) and help organize events (e.g., an annual Symposia). Just under a third of survey respondents (i.e., 30%) indicated that they had taken advantage of the KICP Visitors Program to invite other researchers to campus, though most indicated that they had been involved to varying degrees in planning conferences.

Some Fellows initially feared that formal conference and seminar planning opportunities would be a distraction from their primary research objectives, but most came to see the value of organizing events and playing host to some of the leading scholars in their fields. Furthermore, the Fellows were greatly appreciative of the administrative support they received from staff at KICP to help with travel arrangements for guests and in arranging meeting space and meals for attendees. This support ensured a high quality event and helped keep the Fellows from getting bogged down in logistics and therefore free to focus on the big ideas and underlying scientific topics and messages they sought to cover. Many Fellows felt that the experience of organizing talks and conferences would be of value to them as they continued along a career path within academia. One Fellow described the experience of planning events as “a good professional development activity” with the added benefit of providing greater “exposure within field.”

“I found being part of the Friday Seminar Committee to be very useful and rewarding.”
Thoughts on the International Fellows Exchange Program

KICP also offers an exchange program that allows fellows to work abroad or offsite with a number of partner institutions and research groups. More than a third (i.e., 38%) of the Fellows who responded to the survey were unaware of the International Exchange Program, and none had yet to participate in an exchange. None-the-less, their thoughts about the program are summarized below.

Some Fellows were justifiably concerned about the logistics of finding housing or leasing out their housing in Chicago during the exchange, and many felt that a short-term move may simply be more appealing to those without spouses and/or families. Others—especially experimentalists—felt that participation in a program of this nature was not feasible due to the nature of their work, i.e., needing to be where their lab and equipment were. Some feared that an exchange would mean lost or less-productive time, and along these lines, one Fellow stated that “you’re at Chicago for a reason; the last thing you want to do is not be at Chicago.” If the work being done at partner institutions is not a good fit with the type of research a Fellow is doing, an exchange may arguably not be in the best interest of a Fellow, however, there may be good opportunities for collaboration that Fellows are simply not aware of. Efforts to better promote those opportunities or conduct “research matchmaking” may facilitate greater participating in the International Exchange Program.

Fellows who are now in faculty positions and have had the opportunity to experience a sabbatical, were easily able to see some of the key benefits of the exchange program, i.e., a change of scenery and exposure to new people, places and ideas. One highlighted the collaborative benefits of being co-located with someone for a period of time, rather than working remotely from one another. Another suggested the value of being able to see how things operate at different institutions—i.e., how things are run and how people interact—something that shorter visits don’t always allow. Other Fellows identified the value in being able to expand their professional network to other institutions. It could be a “great way to get others in the field—at other institutions—to know you and be able to say good things about you.” The exchange program seems to hold potential appeal especially at certain points during the fellowship experience (e.g., after research projects have concluded or while Fellows are waiting to hear back about jobs or further postdoctoral applications). Even though they had not taken advantage of the exchange program, they ultimately recognized it as a unique and beneficial component of the KICP Postdoctoral Fellowship program.
Outreach Programming Experiences

Fifty-Eight percent of the Fellows who completed the survey reported that they participated in outreach programming during their KICP Postdoctoral Fellowship experience. Outreach opportunities cited by Fellows including teaching, giving short talks or lectures, and helping with conferences for science educators and other professionals. Despite the fact that more than a third of the Fellows had not participated in outreach programming as part of their postdoctoral fellowship experience, all indicated an awareness of, and appreciation for the variety of outreach opportunities facilitated by KICP and its Director of Education and Outreach.

For some Fellows, KICP provided a first exposure to outreach programming—for others, KICP offered an easy way to continue with outreach endeavors. In fact, several Fellows noted the fact that KICP made it “easy” to get involved with outreach, because so much of the legwork typically associated with outreach programming was taken care of by dedicated outreach professionals. One Fellow stated that, “there’s something going on all the time. I wound up doing more than I would have otherwise. Unless you are actively trying to avoid it, you will end up doing outreach.”

The Fellows who took advantage of outreach opportunities indicated that these experiences provided teaching experiences that “look good when applying for faculty jobs,” as well as other opportunities that further enhanced their understanding of how best to communicate about scientific information with lay audiences. And while there were clearly personal advantages that could result from doing outreach, Fellows also suggested the benefits that outreach can have on others, “it feels good to have a real impact on people’s lives...most studies don’t directly impact someone’s life, but many of the outreach programs do,” explained one Fellow. Another noted the multiplicative effect of outreach programming, wherein knowledge shared with one group of people could then, in turn, be shared with others. The later is especially exciting in instances where Fellows have been able to share information about cutting edge research and new findings that have not yet made it into textbooks or other media geared toward lay audiences. As further evidence of the multiplicative effect of outreach experiences, two of the Fellows who were interviewed noted that they have sought to replicate some elements of the KICP outreach program at later points in their career—having seen the value of outreach programming and the success of KICP’s initiatives. In short, even though some Fellows have been unable to take advantage of outreach opportunities on a regular basis, there seems to be consensus that the nature and extent of outreach programming offered by KICP is a unique and valuable characteristic of the institute.
Mentorship – From the Fellows’ Perspective

On the one hand a postdoctoral appointment may be seen as a job, but on the other hand, it is also a vital component in a larger educational experience that helps to prepare a young researcher for a career in science. With this in mind, mentorship undoubtedly plays a pivotal role in the post-graduate experience.

Most Fellows indicated that they had an understanding of what a successful postdoctoral experience should be like. They know they are expected to conduct excellent research, publish adequate numbers of papers in prestigious journals (though this number varies based on the particular research area in which a Fellow is focused), and attend conferences. The worst thing you can do as a postdoc, explained one Fellow, is to “not be productive and not be engaged with the scientific community.” Another Fellow pointed out that it is also important to learn how the job cycle works, if a Fellow is solely focused on conducting research, they may not be prepared to submit examples of completed research and published papers when it comes time to apply for subsequent Postdoctoral appointments and jobs.

“It’s hard to tell if your career trajectory is going the right direction before having things validated through a job search process.”

Completion of a PhD program indicates mastery of important skills, however, it does not necessarily guarantee success in postdoctoral programs or subsequent academic/research careers. As such, postdocs have new professional skills and lessons to learn and savvy Fellows realize this fact. Despite having a fairly good sense of what they should be doing in order to be considered successful, many Fellows “crave reassurances that they are doing things right.”

“In an environment where everybody is very good, very productive, we are looking for a metric with which to measure success...we need reassurance that we are doing ok.”

At every academic stage before the postdoc, there is feedback, therefore the concept of self-evaluation may be new and challenging for some postdocs—especially those coming right out of PhD programs. They attribute great value to having a faculty mentor who is able to provide them with an honest assessment of their performance—either by expressing their gratitude for someone who had served in this capacity, or suggesting that this would have been something that would have aided their postdoctoral experience. One of the later Fellows noted that it “would help to have someone sit down with you and reflect on how many papers you’ve written, how many talks you’ve given, how many

\[6\] Davis, 2005.

\[7\] Several Fellows indicated that one paper each year was a good standard metric for postdoctoral success. For others, publication opportunities were more limited due to available data at different points over the course of longer experimental studies. One Fellow set a personal goal of collaborating with at least three different faculty members on projects that ranged for topics where they already had expertise, to topics where new skills had to be acquired.
conferences you’ve attended – and how these things might be viewed by prospective employers. If someone’s not on track to get a strong recommendation letter, they need to know that sooner rather than later, and how to make adjustments so they can receive a strong letter of recommendation.” Another Fellow pointed out that postdocs don’t always “know the difference between projects that make good postdoc projects and projects that help to better establish a good career path.” Likewise, Fellows may need help in fully understanding the tradeoffs and implications of high-profile research that is risky—in terms of its potential to yield findings that advance the field—versus the advantages and disadvantages of safer research. A failed project can be an “ugly sore” on a job application, according to one Fellow, but a successful project that pushes the boundaries of the field in new directions can enable a young scholar to have a “bigger footprint because there is less competition in those areas.” Conversely, a “safe” project may make a postdoc more attractive to academic institutions that don’t have the resources (be it funding, personnel, or equipment) to conduct certain types of advanced research.

Fellows’s reiterated the upside and downside of a standard postdoc position versus a fellowship as it relates to mentorship. In the former, a postdoc “has a built in mentor in the form of the faculty member for whom they are working,” however, conflicts of interest can arise in instances where what’s good for the postdoc isn’t necessarily what is good for the project. “A postdoc with the freedom to research whatever they want to research has to be more proactive in seeking out mentorship.” Most Fellows seem to like the fact that they are “treated like adults” and trusted to advocate for their own well-being, however, this means that Fellows must also be proactive in seeking out the mentorship they need in order to be successful. “If you wanted information, you could get it,” explained one Fellow, “all the information is out there, they [i.e., mentors] cannot always come to you.” Most Fellows found that KICP faculty members’ “doors open” and a generally supportive environment within the institute that helped to fulfill their need for mentorship. Eighty-five percent of Fellows who responded to the survey indicated that a mentor had played a role in contributing to the impacts and outcomes they experienced as a KICP Postdoctoral Fellow; 45% indicated that their research mentor had had an “extremely high level of involvement” in resulting outcomes of the experience. This data suggests that most Fellows were successful in identifying a faculty member who they considered to be a mentor.

Fellows shared examples of what they had learned from their mentors and other ways that their mentors had helped them ranging from general advice (e.g., what hiring committees are looking for; how to write a strong job application and when to apply), to specific recommendations, (e.g., when you give talks, know the people in the room that you are presenting to; when applying for jobs, narrow your focus to one topic or subject that you plan to continue working on). Wisely, one of the Fellows noted that, “there is no one-sized fits all recipe for success. There are many paths to success. Some postdocs will be successful networking, but networking a lot isn’t the only path to success. Not following every piece of advice isn’t going to hurt them. A good mentor encourages everyone to be the best version of their self.”
In addition to having a research mentor, i.e., someone doing research within the same field who can share specific information about what it takes to be successful in that field, Fellows also indicate the potential value of having a “career mentor.” Fellows feel that it would be valuable to have a mentor, either assigned or someone they are encouraged to purposefully seek out, who could help them see the bigger picture and come to understand more fully what it takes to position themselves properly for a job search and to be successful in an academic and/or research-oriented career. Having mentors outside of Fellows’ primary research area can help ensure that they are getting information that is geared toward their long-term professional success. For example, knowing whether a satellite is going to fly is a problem for a research team, “but it’s not necessarily relevant to your career success,” explained one Fellow. Given the hyper-competitive nature of the current job market, with hundreds of applicants competing for the same positions at prestigious institutions, getting effective career mentorship can give postdocs a leg-up over other applicants. Our interviewees saw it as a step in the right direction that KICP now assigns each Fellow a career mentor. It is still up to each Fellow and assigned faculty member to ensure a beneficial mentoring relationship.

Some Fellows also embraced the concept of peer mentors—i.e., partnerships among Fellows who are at similar points during their career. These partnerships could occur within KICP or within larger professional organizations. One Fellow described her experience of a group she participated in during a previous fellowship wherein members of the group helped to hold each other accountable for accomplishing research goals and held joint working sessions. Admittedly, these types of groups are more common in the humanities than the sciences, but this Fellow felt that there were advantages to the type of peer mentorship that such a group was able to offer.

Fellows currently at KICP and those who have kept in touch with people at the University of Chicago noted that they have seen a greater emphasis on mentorship within the KICP Postdoctoral Fellowship program in recent years. Ensuring a strong mentorship program not only has implications for current and future KICP Postdoctoral Fellows, but also has broader implications on the field insofar as many Fellows go on to become faculty members and end up serving as mentors to future generations of scholars as well.

“[It is helpful to] have an opinion from someone at arms length so they can give a more objective view.”
Mentorship – From the Faculty Member’s Perspective

We received a dozen responses to an online faculty survey that asked a variety of questions related to the KICP Postdoctoral Fellowship program including feedback about mentorship experiences. Among the faculty respondents, nearly half (i.e., 5 respondents, 45%) had served as a research advisor or close collaborator to four or more Fellows (2 respondents hadn’t yet mentored any Fellows and 4 respondents had mentored 1 - 3 Fellows). Eight respondents (i.e., 67%) indicated that they had served as an assigned KICP Career Mentor.

Time spent on mentorship. Of those who’ve had experience mentoring in a research-oriented capacity, one or more Fellow, slightly more than half (i.e., 5 of 9 respondents, 56%) indicated that they spent more than ten hours per quarter on research-oriented mentoring, a third (i.e., 3 of 9 respondents, 33%) indicated that they spent 4-10 hours per quarter, and one indicated that he spent less than one hour per quarter. Career-oriented mentoring seems to take slightly less time. Among the respondents who indicated they have also served as a career mentor, the majority (i.e., 5 out of 7 or 71%) said that it took 1-3 hours per quarter; one spent less than one hour per quarter, and another spent 4-10 hours per quarter. Time or, more specifically, limitations on available time was also noted as one of the factors that can make mentorship challenging.

Motivation and expectations for mentorship. Faculty play an important role in the mentorship of Postdoctoral Fellows, be it in a research-oriented capacity or a career-oriented capacity. Research mentorship relationships are allowed to form organically, whereas most of the faculty members serving as career mentors for KICP Postdoctoral Fellows indicated that they were doing so because they had been asked by a KICP administrator to serve in that capacity. One faculty member serving as a Career Mentor, indicated that it seemed like “an excellent way to get to know the Fellows.” All but one of the career mentors indicated that they had some awareness of the specific expectations for being a career mentor.

Impacts of Mentorship. Among nine respondents who provided details about their mentorship experiences, 67% (i.e., 6 out of 9 respondents) felt that they had had a moderate impact on the Fellows they had mentored; a third (33%, 3 respondents) felt that they had had a great impact. According to faculty their mentoring efforts and subsequent impacts have included: efforts to hone research skills, making Fellows aware of opportunities and resources outside of their primary research area, enhancing Fellows’ leadership and teamwork abilities, promotion of a Fellow’s work and developing greater self-promotion skills, providing opportunities to write proposals and co-author papers, and writing recommendation letters that can help Fellows to acquire permanent jobs. In addition to the benefits that they provide to the Fellows, faculty members also feel that the benefit insofar as having bright colleagues with whom they can collaborate.

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8 One of the eight respondents who indicated that he had been a career mentor did not provide responses to subsequent questions about the career-related mentoring experience, bringing the n to 7 for all remaining questions about career mentorship.

“It is fulfilling from my end to have someone good to bounce my ideas off of and discuss research with.”
Career mentorship: Activities and Impacts. Faculty members indicated how they had gone about the task of providing career mentorship to Fellows. For many, this seemed to entail casual and periodic check-ins, slightly more formal discussions (including advice) related career plans and opportunities, sharing of career-related resources, and specific feedback about papers or related to job applications. One Faculty member noted the importance of having a career mentor—i.e., presumably someone outside of a Fellow’s research team—who can suggest a change in research field or mentor when opportunities or experiences are not working to a Fellow’s benefit. Most career mentors felt they had had a moderate impact on the Postdoctoral Fellows whom they’d mentored in a career-oriented capacity; one felt she’d had no impact, and another felt he’d had great impact. In addition to the impact of career mentorship on the Fellows, career mentors also feel that they benefit from the experience as well. They reported gaining knowledge and skills that can be applied to mentoring other postdocs and graduate students.
KICP Postdoctoral Fellowship Impacts

This section of the report focuses on the reported impacts and outcomes of being a KICP Postdoctoral Fellow. We examine employment statistics, including levels of employment satisfaction as well as outcomes related to network-building and other research and professional skills.

Current Employment

We obtained survey responses from 50 current and former participants in the KICP Postdoctoral Fellowship program and searched online to find and confirm employment information for the nine remaining former KICP Postdoctoral Fellows who did not complete the survey. We were ultimately unable to confirm the current employment status of three of the former Fellows. Of the 56 current and former Fellows for whom we were able to obtain employment information, about a third (i.e., 29%) of were currently serving in postdoctoral appointments either at KICP or other educational or research institutions and one was awaiting approval of legal status to work after making a permanent move to the United States. Of the remaining fellows, (i.e., those employed, but not currently doing postdocs, 79% had appointments within academia, (including professors, associate professors, assistant professors, and lecturers); 15% had appointments at national laboratories or governmental research institutions, and only 5% were employed in other STEM industries including engineering and computing.

Eighty-eight percent of survey respondents (i.e., 37 out of 42 respondents) indicate that their current job is oriented toward research. The majority of former fellows who followed an academic career path remained within the fields of Cosmology, Astronomy, or Physics, however, other former fellows have branched out into other academic disciplines including informatics, and Liberal Arts. In sum, former KICP postdoctoral fellows seem to have been largely successful in their efforts to move forward in their scientific careers, be that within academia, national laboratories or other public research institutions, and to a more limited extent, within private industry despite a highly competitive job market.

Satisfaction with Career Path

Despite the path the career path they have taken, an overwhelming majority of survey respondents indicated that they are not only happy with their current career, but also happy with the trajectory of their career path. We asked survey respondents to indicate their level of satisfaction with their current career and the overall career path they’d taken thus far. Overall, 98% of survey respondents indicated agreement and there was little disagreement that they were satisfied with their chosen career path.

According to one Fellow, “academic positions are the holy grail for most postdocs, if they don’t get one they may ultimately feel forced to leave the field.” With that prevailing belief in mind, we were particularly interested in levels of career satisfaction for those who had succeeded in finding employment within academia in comparison with those who were still in a postdoctoral position and with those who had taken research positions outside of academia or in other fields altogether. The following figure shows a breakdown of the mean for responses based on each career category.
According to these survey findings, those in non-research/non-academic positions were extremely satisfied, more so than their colleagues within academia and research. However, statistical analyses of these data determined that the above differences were not statistically significant, due in part, perhaps to the extremely small number of people in the non-academic and non-research category as compared to the other two categories and the overwhelmingly positive feelings among all respondents about their career success thus far. Ultimately, it seems that another Fellow’s assessment of career satisfaction seemed to ring true—he asserted that it is less about where you find employment and more about doing “whatever makes you happy.”

Not only are KICP fellows happy with the trajectory of their career path, but many also feel that their KICP experience was a factor in their success. Despite exceptional educational backgrounds and outstanding roster of previous postdoctoral appointments and accomplishments, 60% of survey respondents agreed (i.e., selected “agree” or “strongly agree” when presented with the statement “My KICP Postdoctoral Fellowship experience gave me a leg up over other candidates when I applied for subsequent postdoctoral experiences or jobs”). This is no small thing given that there are typically hundreds of well-qualified job candidates applying for a much smaller number of jobs that have been open within the fields of Astronomy and Physics in recent years.10

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9 Responses for the “career satisfaction” and “satisfaction with career path” questions were coded as follows: “Not at all Satisfied”=0, “Not Very Satisfied”=1, “Neutral”=2, “Somewhat satisfied”=3, and “Very Satisfied”=4.

10 One fellow cited 443 candidates had applied for a recent position at his university, and another stated that “for every faculty position, more than 200 people apply.” Yet another Fellow noted that when he was applying for jobs in the mid 2000’s he and his colleagues literally saw job postings disappear — i.e., being pulled due to funding cutbacks.
Greater numbers of students completing degree programs in Astronomy and related fields in recent years had led to more postdocs, but this ultimately creates a bottleneck because there are not as many faculty positions as there are qualified postdocs seeking those positions. “I got four job offers and there were only fifteen open positions in my field in the U.S. at the time,” noted one Fellow who felt that his experiences at KICP played a major role in further developing his skill-set and that, along with opportunities to publish many “quality papers” and his advisor’s reputation, helped with a successful job search. Another Fellow praised his mentor’s ability to help him network and make connections within the field that were extremely helpful, and much appreciated, in his job search.

Confidence and Skills for Next Stage of Career

One of the advantages of a postdoctoral appointment, especially at KICP due to the “super-elevated” status that Fellows enjoy, is building greater confidence in one’s readiness to become a faculty member. After interacting “with faculty members every day for a few years, it’s not such a hard thing to imagine doing,” noted one Fellow who felt that his experience as a KICP Postdoctoral Fellow helped him to get past feeling intimidated. Fellows reported greater confidence, stemming not only from frequent and meaningful interactions with faculty members who treated them as “junior faculty,” but also by having greater freedom to chart their own research path.

Fellows’ not only acquired greater confidence in their research abilities, but also came to develop greater confidence through other professional skills that were acquired or honed as part of their KICP Postdoctoral Fellowship. On the survey, Fellows were asked to indicate their level of agreement with a series of statements about various potential outcomes of being a KICP Postdoctoral Fellow. Mean ratings of agreement about having improved communication skills, enhanced leadership skills, and developed management skills as part of the KICP Postdoctoral Fellowship experiences are summarized in the figure below.11

Figure 7: Level of Agreement with Statements About Skill-Improvement

<table>
<thead>
<tr>
<th>Skill Type</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Skills</td>
<td>4.16</td>
</tr>
<tr>
<td>Leadership Skills</td>
<td>4.00</td>
</tr>
<tr>
<td>Management Skills</td>
<td>3.54</td>
</tr>
</tbody>
</table>

11 Responses to these statements were coded such that “strongly disagree”=1, “disagree”=2, “neutral”=3, “agree”=4, and “strongly agree”=5.
Impacts on Research and Interdisciplinary Approach to Research

Survey respondents were asked to rate their agreement with a series of statements on research-related outcomes of their Fellowship experience:

- My KICP postdoctoral experience provided adequate opportunities for me to pursue my research interests. (i.e., opportunities to pursue research interests)
- My KICP postdoctoral experience broadened my research interests. (i.e., broadened research interests)
- My KICP postdoctoral experience made me re-think my previous research interests and objectives. (i.e., rethink previous research objectives)
- My KICP postdoctoral experience encouraged me to develop a more interdisciplinary approach to research. (i.e., developed a more interdisciplinary approach)
- My KICP postdoctoral experience provided sufficient opportunities and support for me to publish papers. (i.e., opportunities to publish papers)

The figure below presents an overview of respondents’ average levels of agreement with each of the statements above, when coded such that “strongly disagree”=1, “disagree”=2, “neutral”=3, “agree”=4, and “strongly agree”=5.

**Figure 8: Level of Agreement with Statements About Research-Related Outcomes**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agreement Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunities to pursue research interests</td>
<td>4.60</td>
</tr>
<tr>
<td>Opportunities to publish papers</td>
<td>4.33</td>
</tr>
<tr>
<td>Broadened research interests</td>
<td>4.14</td>
</tr>
<tr>
<td>Rethink previous research objectives</td>
<td>3.44</td>
</tr>
<tr>
<td>Developed a more interdisciplinary approach</td>
<td>3.42</td>
</tr>
</tbody>
</table>

Further statistical analysis revealed slight, but significant differences among different cohorts’ agreement that the program had “broadened their research interests.”

12 For each question, significant differences in response distributions across cohorts, Broaden: $\chi^2(12) = 22.42, p < .05.$
The evaluation team also explored whether there were trends among fellows who reported joining research teams outside of their primary research area in comparison with those who did not. Findings indicate that participants who joined research groups outside of their primary research areas were more likely to have developed an interdisciplinary approach to research and say that their research interests were broadened. \(^\text{14}\)

Figure 10: Distribution of Statistically Significant Responses (Fellows Who Joined Teams Outside Their Primary Research Areas vs. Those Who Did Not)

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\(^{13}\) Five cohorts were established based on the year respondents started their KICP Postdoctoral Fellowship: 1) 2001-2003, 2) 2004-2006, 3) 2007-2009, 4) 2010-2012 and 5) 2013-2015.

\(^{14}\) Significant differences emerged between those who did and did not join research teams from outside their primary research field, Interdisciplinary: \(\chi^2(4) = 10.41, p < .05\), Broaden: \(\chi^2(3) = 13.94, p < .01\), with those who did join outside research teams reporting higher agreement that their postdoc experiences impacted their ability to develop interdisciplinary research and broaden their research interests.
Fellows praise the interdisciplinary nature of KICP, and its unique breadth and depth within the field of cosmology—including both theoretical and experimental approaches to cosmological research. They also value the extended network of faculty, students, and postdocs affiliated with Fermi and Argonne Labs.

“The interdisciplinary aspects of the department and the integration of theory/observing/data analysis/instrument building really appealed to me.”

Forming Professional Networks

Forming strong networks among professional colleagues is certainly a desirable outcome of a postdoctoral experience. In fact, “networking is almost as important as the science you do,” suggested one Fellow. To measure networking outcomes related to the KICP Postdoctoral Fellowship experience, Fellows were asked to indicate how much they agreed with two statements about networking:15

- My KICP postdoctoral fellowship helped me network and develop relationships with other researchers in my field. (i.e., “network in my field”)
- My KICP postdoctoral fellowship helped me network and develop relationships with researchers in other related fields. (i.e., “network in related fields”)

The following figure summaries average agreement ratings across all respondents.

**Figure 11: Level of Agreement with Statements About Networking**

<table>
<thead>
<tr>
<th>Network in my field</th>
<th>4.24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network in related fields</td>
<td>3.80</td>
</tr>
</tbody>
</table>

Not surprisingly, Fellows felt that they had strong opportunities to network with researchers in their own field, but the fact that many also feel they were able to network with those outside their own fields is a testament to the cross-disciplinary strength of KICP.

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15 Responses were coded such that “strongly disagree”=1, “disagree”=2, “neutral”=3, “agree”=4, and “strongly agree”=5.
Sources of Impact

Survey respondents were also asked to indicate the extent to which each of several different elements associated with the KICP Postdoctoral Fellowship program contributed to subsequent impacts and outcomes experienced as a result of participation in the program. The following figure summaries average agreement ratings across all respondents—ordered by the extent of impact from greatest to least based on the mean of the responses for each item.

The data above suggest that research opportunities and the related flexibility to pursue personal research interests or set one’s own research agenda—followed closely by related publication opportunities—were the elements of the program that had the greatest impact on subsequent outcomes and impacts of the KICP Postdoctoral Fellowship experience.

16 Responses were coded such that “not involved at all”=1, “very little involvement”=2, “somewhat involved”=3, “high level of involvement”=4, and “extremely high level of involvement”=5.
The next grouping of programmatic elements suggest the importance of people at KICP, including faculty—especially those serving in formal and informal mentorship capacities—staff, and other postdocs. A third cluster of elements suggests the value of financial support (i.e., pay and additional funding to attend conferences) as well as other tangible resources (e.g., access to technology). A final cluster of elements in the figure above suggest that activities considered to be optional or secondary in importance to research objectives that were seen as being much more central to the fellowship experience, were seen as less important but, nonetheless, still had an impact on the experience of most Fellows.
Comparisons to Other Postdoctoral Programs

In addition to learning more about the KICP Postdoctoral Program itself, KICP stakeholders were also interested in learning how the program compares to other postdoctoral fellowship experiences. This was done through a two-pronged evaluative approach—the first being a set of questions for current and former KICP Fellows on the survey and interview protocols, and the second being a set of interviews with individuals who had turned down a fellowship offer from KICP. In this section, similarities and differences between the KICP Postdoctoral Fellowship and other postdoctoral fellowship experiences will be identified and discussed.

Fellows Views on the KICP Program in Comparison to Other Programs

Survey respondents were asked to assess the KICP Postdoctoral Fellowship program in comparison to other postdoctoral fellowships and programs both in terms of the benefits offered to KICP postdoctoral fellows as well as the resulting professional advantages. Specifically, Fellows were asked to rate the KICP program in comparison to other programs “in terms of the benefits offered” and “in terms of resulting professional advantages.” The mean for Fellows’ responses to both questions was 4.21, indicating strong beliefs that the KICP Postdoctoral Fellowship experience fairied quite well in comparison to other postdoctoral experiences with which respondents were familiar.

Forty-two percent of respondents thought the KICP Postdoctoral Fellowship program offered benefits that were “a little stronger” than those of other program, and another 40% of respondents thought the KICP Postdoctoral Fellowship program offered benefits that were “a lot stronger” than those of other programs. Similarly, 38% of survey respondents thought that the KICP Postdoctoral Fellowship experience was “a little stronger” than other programs in terms of the professional advantages it offered in comparison to other programs, and 43% thought that the KICP Postdoctoral fellowship experience was “a lot stronger” than other programs in terms of the professional advantages it offered.

Non-Fellows Views on Their Postdoctoral Experiences

As part of this study, the evaluation team conducted extensive interviews with three individuals who had been offered a KICP Postdoctoral Fellowship, but who ultimately decided not to accept the offer for various reasons. For simplicity’s sake, we’ll call them “non-Fellows” though all went on to accept Fellowships at other institutions.

The comparison interviews suggest that non-Fellows are more similar than dissimilar in comparison with those who accepted a position at KICP. They place comparable value on the research freedom associated with fellowships (in contrast to standard postdoctoral experiences), though they also feel that theorists face limitations given the constraints of needing “tens of millions of dollars and hundreds of people working together to learn something new about the nature of the universe on a large scale.

17 For analysis purposes, responses were coded based on the following scale: “a lot weaker” was coded as 1, “a little weaker” was coded as 2, “about the same” was coded as 3, “a lot stronger” was coded as 4, and “a lot stronger” was coded as 5.
They faced similar concerns regarding the timing of large-scale research projects and the ability of those projects to pay-off within a timeframe that will ultimately benefit a postdoc’s career. They have similar desires for feedback about their performance—and while not being micromanaged was appreciated by the non-Fellows we spoke with, they also noted the potential challenges for individuals who are not as successful in asserting themselves. Non-Fellows indicate having to be comparably proactive in seeking out appropriate mentorship—as one of the non-Fellows noted, “its left up to junior people to assert themselves.” Non-Fellows also share similar concerns about the challenging nature of the job market. Likewise the non-Fellows shared many similar outcomes also reported by KICP Postdoctoral Fellows, including increased confidence and improved communication, leadership, and management skills. These non-Fellows were pleased by having been accepted for the KICP Postdoctoral Fellowship, but ultimately went a different way based on better perceived fit of available opportunities (e.g., work groups, projects and faculty mentors) at another institution and due to logistical issues such as the acceptance timeline and current and/or possible work opportunities for significant others.

Non-Fellows sought out and accepted their postdoctoral appointments for similar reasons. Because there were only three non-Fellows who completed interviews, we were unable to draw a statistical comparison between their responses and those of the KICP Postdoctoral Fellows, however the figure below shows average ratings of importance for a series of factors.\(^\text{18}\)

**Figure 13: Importance of Fellowship Selection Factors (Fellows vs. Non-Fellows)**

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<thead>
<tr>
<th>Factor</th>
<th>Fellows</th>
<th>Non-Fellows</th>
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<tbody>
<tr>
<td>Prestige</td>
<td>2.56</td>
<td>2.00</td>
</tr>
<tr>
<td>Research Reputation</td>
<td>3.14</td>
<td>1.67</td>
</tr>
<tr>
<td>Faculty in General</td>
<td>3.38</td>
<td>2.00</td>
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<tr>
<td>Specific Faculty</td>
<td>3.30</td>
<td>3.67</td>
</tr>
<tr>
<td>Flexibility</td>
<td>3.20</td>
<td>3.00</td>
</tr>
<tr>
<td>Funding</td>
<td>2.20</td>
<td>0.67</td>
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</table>

\(^{18}\) See full set of questions for the Comparison Group interviews in Appendix B.
Differences in non-Fellow’s postdoctoral program experiences stemmed from the environments and research groups within which they ultimately found themselves working. One of the non-Fellows indicated that his postdoc environment was “very competitive in a negative sense.” Rather than working collaboratively, and reaping the benefits of a collegial postdoctoral cohort, his experience was negatively influenced by the fact that everyone had a sense that they were “all competing for the same jobs.” Conversely, another postdoctoral experience that included a supportive mentor who “went out of his way to make sure that we all had experiences that would help to build our skills and career” was described as “fantastic.” Being a part of the program and working with people who were a good fit for the non-Fellows’ skills, interests, and preferred style of work were clearly preferable to situations where such a “fit” was absent.

One non-Fellow highlighted the limitations of having a more limited cohort of other postdoctoral fellows at his institution—instead of being able to form strong partnerships with other fellows within his institution, he had to seek peer partnerships at other nearby universities. However, two non-Fellows indicated the benefits of having a more diverse cross-disciplinary cohort of fellows including those from other fields such as biology, chemistry, and mathematics and economics. One of these non-Fellows indicated that he found talks and programming from different fields to be intellectually stimulating and benefited from being exposed to cutting edge research and techniques—especially those involved in large-scale computing projects. Through this more diverse network of postdocs, he was able to identify someone outside of his field who had the skills needed to help him on a particular type of analysis, and also identified opportunities where he was able to make contributions outside of his field based on his unique expertise and approach to data analysis. Other reported outcomes (i.e., average level of agreement with each of the following statements) for members of the comparison group alongside those of KICP Postdoctoral Fellows are summarized in the figure on the following page.

- Helped me network and develop relationships with researchers in other related-fields.
- Helped me network and develop relationships with other researchers in my field.
- Provided sufficient opportunities and support for me to publish papers.
- Gave me a leg-up over other candidates when I applied for subsequent postdoctoral experiences or jobs.
- Encouraged me to develop a more interdisciplinary approach to research.
- Made me re-think my previous research interests and objectives.
- Broadened my research interests.
- Provided adequate opportunities for me to pursue my research interests.
- Helped me develop management skills.
- Allowed me to enhance my leadership skills.
- Enabled me to improve my communication skills.
Due to a low sample size (i.e., 3) in the comparison group, the findings above are not statistically significant. It should also be noted that there was often great variability of responses among the non-Fellows, further supporting the assertion that outcomes are largely depending on the nature of the experience and the extent of one’s ultimate “fit” with the position they select.

Despite ultimately selecting a different postdoctoral path, it is important to note that each of the non-Fellows did acknowledge the prestige of KICP and the University of Chicago. One non-Fellow also cited the unique strength of KICP based on its inclusion of a diverse array of theorists as well as experimentalists within the field of Cosmology.
The figures to the left seek to compare current and former KICP Postdoctoral Fellows (n=55) with current and former Hubble Fellows (n=208) and AAPF Fellows (n=109).

The “Academic” designation includes former fellows who are now serving as faculty members and/or staff researchers at academic institutions. The “Research” designation includes former fellows who have long-term appointments or staff positions at national laboratories or other research institutions. In each of the figures to the left, “Academic” and “Research” appointments were combined.

The “Postdoc” designation includes current and former fellows who are currently in a postdoctoral position (i.e., a shorter-term career appointment).

The “Other” category includes all other current and former fellows for whom current employment data could be found who are employed in all other fields or industries e.g., commercial data analysts, engineering, etc.

The slight differences in current career categories for participants in each of these fellowship programs were not found to be statistically significant. In other words, KICP Fellows have equivalent rates of placement in permanent academic and research positions as those who completed other prestigious fellowships.
Is the whole greater than the sum of the parts?

KICP posits that the whole or resulting impact of the Postdoctoral Fellows program is greater than the sum of the parts—i.e., there is greater value that results from having such a program at KICP or that results from being a part of the Postdoctoral Fellows program than would otherwise be possible by simply funding great young scholars to do great research. We posed this question to current and former Fellows as well as faculty members and sought related information and evidence related to the question throughout the evaluative process.

Benefits Based on the Unique Combination of People

Fellows frequently noted the benefits of having a critical mass of the leading researchers in the field of Cosmology—including both theorists and experimentalists—and the notoriety and prestige that results from having such an exemplary and unique group of scholars working together in one place. One fellow noted that “few places can make the claim that they are the best, but Chicago is one of them,” he likened the experience to a great party—when all the right people are showing up, everybody wants to be there, he explained. Fellows noted that they are an important part of the equation as well, and indicated that they are treated as such by others within KICP. “High-quality postdocs increase the quality of the graduate program at an institution as well,” explained one of the former Postdoctoral Fellows. Another identified the cumulative effect of having so many great postdocs on the ability to keep attracting the best and brightest young scholars as Fellows.

“To me, the number one advantage the KICP offers is being exposed to the vast collection of leading researchers here at the University of Chicago and nearby national laboratories. The academic talent here is astounding.”

A Diverse and Engaging Environment

Fellows describe the environment at KICP as “active,” “lively,” “vibrant,” and one that makes them feel like they are “plugged in” to their field. Many Fellows cited the frequent presentations and talks by “top notch” people within the field. These events not only give Fellows a chance to hear about a wide range of research being done within the field of Cosmology and in related areas, but also give Fellows a chance to interact and make connections with leading scholars from all over the world. One fellow described this as “a programmatic way of expanding horizons.” Another noted that he didn’t realize how much he valued the constant exposure to new information and ideas until he was in an environment where it was lacking. Where programming is concerned, Fellows take their cue from faculty members who are seen as being far more engaged in regular events and programming than they are at other institutions.

“The diversity of all these different people gathered in this institute with different expertise in different fields, helped me a lot.”
A Supportive and Collegial Environment

Of further importance from a Fellow’s perspective, most find KICP to be an open and collegial environment wherein Fellows feel they are welcome and able to make significant contributions. Fellows describe their experiences of being welcomed by faculty members, feeling that everyone is approachable, and having the ability to “knock on any door.” They described instances where faculty members reached out to them to ask how they were doing and to make sure they were settling in well. They also express appreciation for a tolerant, non-hostile environment that is conducive to constructive discussions and debate. The KICP environment stood in stark contrast to others that some Fellows had experienced elsewhere—“people are incredibly competitive, but not working against each other,” explained one Fellow and as such, KICP is “far from the norm in terms of how collegial it is.” Saying that KICP offers a collegial environment is certainly a reference to cultural aspects of the institute, but has also taken on new meaning in recent months as faculty and postdocs have moved into a new building. Many feel that the new building has features (including having everyone housed under one roof and offering a variety of meeting/work spaces and common areas) that can help to facilitate discussion and foster greater collaboration among members of KICP.

Broader Impacts on the Field of Cosmology

The diverse yet focused nature of the work being done at KICP has significant implications for the field. “Center is a good word for it,” noted one Fellow who asserted that KICP was a “center of mass” and felt that its highly interconnected nature helped lead the field in new directions; “In other programs…most academic environments…what you were doing yesterday, is what you are doing today and what you will be doing tomorrow. KICP opens things up.” Along these lines, many Fellows felt that being exposed to such a diverse range of research related to the field of Cosmology was not only “exhilarating” but also an important contributing factor in KICP’s ability to help advance the field. Likewise, being a hub for a variety of different types of research also uniquely enables KICP members to work together toward answering big questions about our universe.

The practice of hiring brilliant people, giving them support and resources, but giving them the freedom, and trusting them to do the best science possible also helps to keep KICP on the cutting edge of Cosmological research. As one Fellow asserted, offering this type of freedom “fosters a breeding ground for scientific innovation.” It has also been asserted by some that a strong cohort of postdocs helps to form a strong backbone of a research institution. “The postdoc is the workhorse of cutting edge research,” Noted one former Fellow who is now a faculty member at a research institution, “as faculty you are swamped with so many things that demand your attention…a postdoc is a perfect instrument of producing great science right now because they are enthusiastic about jumpstarting their career.” Despite the high costs associated with a Fellowship program, one Fellow pointed out that there is a positive return on the investment, insofar as Fellows are also one of the primary sources of the institute’s subsequent success. One of the former KICP Postdoctoral Fellows indicated his belief
that some projects and experiments may not have been successful “without the efforts of the postdoctoral fellows who contributed their time and talents.” Another area where postdocs are able to make unique connections is through helping to connect different research groups and keeping them informed about what’s going on in a larger sense. According to one faculty member, “postdocs are able to attend group meetings for multiple different groups and essentially stitch them together and help different groups that are much too busy to actually pay attention to what each other are doing...to point out interesting things that will be important to both groups that they might not have otherwise noticed,” as such they help to “anchor the groups into a whole in a way that wouldn’t happen without the postdocs.” These significant efforts and unique contributions of the Postdoctoral Fellows certainly seem to enhance the larger institute’s ability to have great influence and impact within the field of Cosmology.

Opportunities for bright and energetic Fellows to work together with others who share a similar passion for research and the field of Cosmology also helps to foster the development of innovative projects and collaborations. One postdoc cited his involvement with Spacewarps, a citizen science initiative designed to crowdsource the process of identifying galaxies that may have passed through a gravitational lens. Another former Fellow expressed her delight with being able to form collaborations to work on “problems that I’m interested in solving instead of problems I can attack with what I know now.”

“I began long-lasting collaborations while at the KICP, that continue to this day.”

There is also a broader impact on the field beyond KICP because Fellows spread out and go to other institutions, carrying forward their skills, knowledge, partnerships, and sometimes projects that were developed at KICP. Through their knowledge of KICP, former Fellows are also able to recommend students who would be a good fit for the work being done at KICP.
RECOMMENDATIONS

It is important to note that Fellows recognize the great effort that KICP is constantly making to help ensure that it stays on the cutting edge and serves in a leading role within the field of Cosmology. For example, one former Fellow stated that, “they take pride and put a great deal of effort into building a strong interactive community.” In fact many of the Fellows, and non-Fellows that we spoke with expressed gratitude for KICP’s willingness to conduct this study of its Postdoctoral Fellowship program. The recommendations made by current and former Fellows, and KICP faculty are therefore summarized in this final section of the report for the benefit of KICP as it continues to lead and innovate not only within the field of Cosmology itself, but also as a leading provider of postdoctoral programming within the field.

Mentorship Recommendations

Provide More Feedback and Evaluation Opportunities for Fellows

For many Fellows, a postdoctoral experience is the first time they have existed in an academic environment that doesn’t have regular evaluative components. Many of the postdocs consulted as part of the research process for this study therefore expressed a desire for more explicit statements about what is expected of them—especially in any ways that KICP may differ from broader postdoctoral program expectations—and a somewhat more formal evaluation processes to provide reassurances that they are doing well and constructive feedback to help ensure they stay on the right track for longer-term career success. The current system and environment offered by KICP succeeds insofar as mentorship and feedback seem readily available to Fellows if they take the initiative to seek them out, however, the addition of prescriptive check-ups occasionally can take some of the pressure off of Fellows to advocate for themselves. One Fellow also suggested implementing “exit interviews” as an opportunity for Fellows to reflect on their experience and provide feedback to KICP as well.

Further Enhancements to the Career Mentorship Program

Fellows and faculty members alike see the value in the Career Mentoring program—not only as a unique aspect of the KICP Postdoctoral Fellowship experience, but also as a programmatic element that can help all Postdoctoral Fellows to have the best experience possible and maximize the likelihood of success in their subsequent job search and long-term career path. With that in mind, faculty members offered the following suggestions for further improvements to the Career Mentoring program:

• Ensure that Fellows and Career Mentors are clearly identified to one another, as is their role and any subsequent expectations for that relationship.
• Provide periodic reminders to faculty members to reach out to the Postdoctoral Fellows that they mentor.
• Have mentors engage with Fellows as soon as they accept the KICP Postdoctoral Fellowship position.
• Have more than one assigned mentor per fellow in different research areas and at different seniority.
• Consider organizing a short workshop for faculty to share their experience as career mentors to help ensure that “best practices for mentorship” are uniformly applied by all Career Mentors.
• There also seemed to be moderate interest among faculty in being given readings or handouts that provide mentoring tips and having someone designated as a person they can turn to if they have questions about how best to mentor a specific Fellow.

Offer Longer-Term Networking Opportunities
Several Fellows expressed a desire for a strengthened community of KICP Postdoctoral Fellows, expanded communication between current and past Fellows, as well as additional efforts that can help to foster a longer-term, lifetime relationship with KICP. Some Fellows said that they rarely hear from KICP but would definitely like to. Others indicated that they would like to be invited back to attend presentations or speak. It is also, perhaps, a testament to the Fellows program that Fellows see the value of networking opportunities with the KICP Postdoctoral program and therefore want to know more about other KICP Postdoctoral Fellows and have ways of connecting with the Fellows who came before them, as well as those who will come after them.

Promoting Postdoctoral Fellows’ Accomplishments
Some former Fellows felt that KICP could be more proactive in nominating Fellows for awards as a way of recognizing the value of their contributions. This could help to bring even greater notoriety to KICP, but also offer benefits to Fellow’s long-term career success. Fellows suggested additional ways that KICP could take on more institutional ownership of Fellows’ professional success including efforts to encourage more faculty—especially more senior members of the faculty—to write recommendation letters on behalf of Fellows and to ensure that former Fellows are considered and invited to apply for positions at the university that may be a good fit for their skills and interests.

Modify Application/Acceptance Process
Both Fellows and non-Fellows suggested that slight modifications to the application process may be an enhancement to the program. Since it is in the best interest of applicants and KICP alike to ensure a good fit between Fellows’ skills and interest and the work being done at KICP, providing more time for Fellows to consider and respond to the offer has a two-fold benefit. With more time to consider the offer, Fellows have a greater ability to determine if it is the best possible fit for their personal goals and interests. Providing more time, or greater flexibility in the response timeline may also better enable would-be Fellows to work out the logistics of a move to Chicago.
REFERENCES

https://www.aau.edu/WorkArea/DownloadAsset.aspx?id=1944

https://www.aau.edu/WorkArea/DownloadAsset.aspx?id=468


APPENDICES

Appendix A: KICP Fellows Interview Protocol

Current Occupation
Let's start by talking a little about the work you are currently doing. Is this the type of career you envisioned while you were pursuing your graduate studies and doing postdoctoral work?

To what extent did your experience as a Postdoctoral Fellow at the University of Chicago help to prepare you for your career or have an impact on your career trajectory?

Were there any shortcomings in the program’s ability to help prepare you for the next stage of your career?

Expectations for participation

Coming into the Fellows program, what were your expectations? What did you hope to get out of your postdoctoral fellowship experience?

• Did you have specific research goals or interests?
• Did you have any other specific objectives?

Postdoctoral Fellowship Experience and Impacts

How would you describe the general research climate within the program?

Did you have adequate flexibility to explore different research opportunities?

• What were the advantages of having the freedom to explore different research opportunities/implement your own research agenda?
• Are there any drawbacks to having this type of flexibility/freedom?

Can you tell me about the value of the talks, colloquia, symposia, and conferences that you attended?

What did you think about the opportunities to help organize Seminars, or suggest presenters/topics for Colloquia, and/or other workshops?

• What were the strengths of these opportunities?
• Were there any challenges?

What types of outreach experiences did you have?

• What types of impact did your outreach experiences have on your fellowship experience or subsequent professional pursuits?

Did you participate in the International Fellows Exchange Program?
IF YES:
• Tell me a little about your experience with the exchange program (where did you go? What did you do?)
• What were the greatest strengths of this experience?
• Were there any challenges or drawbacks to participating in this program?

IF NO:
• Were you aware of the International Fellows Exchange Program?
• Did you think about participating in the exchange program (why/why not?)
• Do you think a program like the International Fellows Exchange program is an attractive feature for people considering the KICP Postdoctoral Fellows Program?

Now, let’s talk about the mentorship that you received?
• Did your mentor help to prepare you for the next stage of your career? How so?
• Were there any obstacles or challenges to an effective mentorship experience?
• Is there anything else that your mentor could have done/done differently to help you?

Broader Impacts

Are there any other impacts or outcomes of your Postdoctoral Fellows program that we haven’t yet talked about?

To what extent (and how) do you think the Fellows program helps to transform and advance cosmology and particle physics? (i.e., furthering the primary goal of KICP)

What’s special about KICP and the environment that it offers to faculty, students and postdoctoral Fellows? Is the whole (i.e., the entire Fellows experience) greater than the sum of all the “parts” that KICP offers?

Comparison to other Postdoctoral Programs

What advantages does the KICP Postdoctoral Fellowship Experience offer over other postdoctoral fellowships that you are aware of?
• Do you think the KICP Postdoctoral Fellows program gave you an advantage over people who did postdocs elsewhere?

Are there any ways that the KICP Postdoctoral Fellowship program lags behind or might be less successful than other Postdoctoral programs that you are aware of?

Recommendations and Suggestions for Improvement

Based on your experiences thus far, are there any suggestions or recommendations that you have for improving the Postdoctoral Fellows Program?
Appendix B: Comparison-Group Interview Protocol

**Postdoc Experience**
You were offered a fellowship at University of Chicago but did not take it. Did you end up taking a fellowship elsewhere? Where? Which fellowship?

Have you participated in any other postdoctoral programs?

What reasons drove your decision to accept that Postdoctoral appointment?

Specifically, How important were each of the following? You can say: Not important at all, Not very important, Somewhat important, Very important, or Extremely important

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<th>Not important at all</th>
<th>Not very important</th>
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<td>a) Level of funding offered</td>
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<td>pursue my personal research</td>
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<td>interests</td>
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<td>c) Specific Faculty Members</td>
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<td>d) Strength of the Faculty/</td>
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<td>Program in General</td>
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<td>e) Prominence or reputation</td>
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<td>f) The prestige associated</td>
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<td>with that Fellowship/program</td>
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Was there anything that didn’t appeal to you about the KICP Postdoctoral Fellows program at the University of Chicago?

**Postdoctoral Fellowship Experience and Impacts**
What were the strengths or most helpful aspects of your postdoctoral experiences?

Were there any limitations or weaknesses to your postdoctoral experiences?

In your postdoctoral program, do you feel that you had adequate flexibility to explore different research opportunities of interest to you or were you mostly affiliated with one lab or one project?

As part of your postdoctoral experience, what types of mentorship did you receive?

Did your mentor(s) help to prepare you for the next stage of your career? How so?
Next I’m going to read a series of statements and I’d like you to indicate your level of agreement with each one. You can say: Strongly Disagree, Disagree, Neutral, Agree, or Strongly Agree.

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<tr>
<th>Statement</th>
<th>SD</th>
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<tr>
<td>Enabled me to improve my communication skills.</td>
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<td>Allowed me to enhance my leadership skills.</td>
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<td>Helped me develop management skills.</td>
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<td>Provided adequate opportunities for me to pursue my research interests.</td>
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<td>Broadened my research interests.</td>
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<td>Made me re-think my previous research interests and objectives.</td>
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<td>Encouraged me develop a more interdisciplinary approach to research.</td>
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<td>Gave me a leg-up over other candidates when I applied for subsequent postdoctoral experiences or jobs.</td>
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<td>Provided sufficient opportunities and support for me to publish papers.</td>
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<td>Helped me network and develop relationships with other researchers in my field.</td>
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<tr>
<td>Helped me network and develop relationships with researchers in other related-fields.</td>
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Are there any other impacts or outcomes of your postdoctoral experience that we haven’t yet talked about?

**Current Occupation**

Are you currently employed? If so, Where are you currently employed? What is your current job title?

Is this the type of career you envisioned while your were pursing your graduate studies and doing postdoctoral work?

How satisfied are you with your current career? (Not at all satisfied, not very satisfied, neutral, somewhat satisfied, very satisfied)

How satisfied are you with the overall career path you’ve taken thus far? (Not at all satisfied, not very satisfied, neutral, somewhat satisfied, very satisfied)

To what extent did your postdoc experience help prepare you for your career or have an impact on your career trajectory?

Were there any shortcomings in your program’s ability to help prepare you for the next stage of your career?

Have you been the recipient of any professional awards (NSF PCASE, etc.)?

**Comparison to other Postdoctoral Programs**

What advantages did your postdoctoral experience offer over other postdoctoral fellowships that you are aware of?

Did your postdoctoral experience give you an advantage over people who did postdocs elsewhere?

Were there any ways that you felt your postdoctoral experience was less successful or less helpful than other Postdoctoral programs?

Is there anything else you’d like to share about your postdoctoral experience, or thoughts that you have on postdoctoral experiences in general?
Appendix C: KICP Postdoctoral Fellows Survey

Participation Logistics

1. What year did you start your Postdoctoral Fellowship at the University of Chicago?

2. What year did you complete your Postdoctoral Fellowship at the University of Chicago?

3. Did you have any postdoctoral appointments before you were a KICP Postdoctoral Fellow? Y/N

4. Have you had any postdoctoral appointments since you were a KICP Postdoctoral Fellow? Y/N

5. If you answered "yes" to either question 3 or 4, what other postdoctoral appointments have you had?

Participation Frequency

6. For each of the following, please indicate the frequency of participation (on average):
   RESPONSE SCALE: NEVER, OCCASIONALLY, OFTEN, ALWAYS
   a) Friday Lunch Seminars
   b) KICP Colloquium
   c) Topical workshops
   d) Colloquia
   e) Symposia
   f) Talks
   g) Outreach activities

7. In general, how often did you attend talks or presentations during your Fellowship:
   RESPONSE SCALE: NEVER, OCCASIONALLY, OFTEN, ALWAYS
   a) related to your primary research area?
   b) not directly related to your primary research area?

Types of Participation

8. Did you participate in the International Fellows Exchange Program? Y/N, or:
   “Was not familiar with that opportunity as part of my Postdoctoral Fellowship experience”

9. Did you make use of funding available through the Visitors Program to invite other researchers to campus? Y/N or: “Was not familiar with that opportunity as part of my Postdoctoral Fellowship experience”

10. Did you participate in any outreach programming during your Postdoctoral Fellowship experience? Y/N
11. While serving as a Postdoctoral Fellow, did you ever join a team or contribute to a project outside of what you would consider to be your primary research area? Y/N

12. Were there other things that you did or experienced while at the University of Chicago that you would consider important parts of the Postdoctoral Fellows program?

**Program Selection Factors**

13. The KICP Postdoctoral Fellowship was... (check all that apply)
   - [ ] My top choice of Postdoctoral Fellowships
   - [ ] The best Fellowship I was offered
   - [ ] The only Fellowship I was offered
   - [ ] The only Fellowship that I applied for

14. Did you visit the campus before accepting the Fellowship at University of Chicago? Y/N

15. If you answered yes to question 15, in what ways did your visit have an impact on your decision to accept the Postdoctoral Fellowship at University of Chicago?

16. How important were each of the following in your decision to apply for and/or select the KICP Postdoctoral Fellowship:
   - Level of funding
   - Freedom and flexibility to pursue my personal research interests
   - Specific Faculty Members at the University
   - Strength of the Faculty/Program in General
   - Prominence or reputation for a specific type of research
   - The prestige associated with this Fellowship

**Impacts of Participation**

17. Please indicate your level of agreement with each of the following statements. My Postdoctoral Fellows program experience...
   - RESPONSE SCALE: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
   - a) Enabled me to improve my communication skills.
   - b) Allowed me to enhance my leadership skills.
   - c) Helped me develop management skills.
   - d) Provided adequate opportunities for me to pursue my research interests.
   - e) Broadened my research interests.
   - f) Made me re-think my previous research interests and objectives.
   - g) Encouraged me develop a more interdisciplinary approach to research.
h) Gave me a leg-up over other candidates when I applied for subsequent postdoctoral experiences or jobs.

i) Provided sufficient opportunities and support for me to publish papers.

j) Helped me network and develop relationships with other researchers in my field.

k) Helped me network and develop relationships with researchers in other related-fields.

18. Are there any other impacts or outcomes that you would attribute (at least in part) to your Postdoctoral Fellows experience?

19. Please list any professional awards (NSF PCASE, etc.) you have received.

20. Are you currently employed? Y/N

Current Occupation/Position

21. What is your current job title?

22. What is the name of the Institution at which you are currently employed?

23. Would you classify your current job as academic/research-oriented?

Professional Duties & Satisfaction

24. For this question, your responses should total 100% - Please do not include the percentage sign.
   What percentage of your work is spent...
   ...On research-related activities
   ...Teaching
   ...On outreach activities
   ...Mentoring/Advising
   ...Doing something other than those activities listed above

25. Please use the space below to provide additional information that will help us better understand the work that you currently do.

26. How satisfied are you with...
   RESPONSE SCALE: Not at all satisfied, Not very satisfied, Neutral, Somewhat satisfied, Very satisfied
   ...your current career?
   ...the overall career path you’ve taken thus far?

27. Please share any additional comments related to you satisfaction with your current career and/or the career path you’ve taken:
Sources of Impact

Next, we would like you to consider the importance of a variety of experiences, resources, and opportunities that you may have experienced as a Fellow.

28. To what extent were each of the following components of the Postdoctoral Fellows program involved in the impacts and outcomes you experienced as a result of your participation in the program:
   RESPONSE SCALE: Not involved at all, Very little involvement, Somewhat involved, High level of involvement, Extremely high level of involvement, N/A
   a) The funding you received as a Fellow
   b) Additional funding available to attend conferences
   c) Additional funding to bring other scholars to the University of Chicago
   d) Conferences, Symposia and Talks offered at the University of Chicago
   e) Opportunities to organize Conferences, Symposia and Talks
   f) Technology and other resources provided by the program
   g) The flexibility to explore your own interests
   h) Research Opportunities
   i) Publication Opportunities
   j) Assistance and support from KICP staff
   k) Your Research Mentor
   l) Your Career Mentor
   m) Other University of Chicago Faculty
   n) Other Fellows or Postdocs
   o) Other Students at the University of Chicago
   p) Outreach and Teaching Opportunities

Comparison to Other Programs

29. Compared to other Postdoctoral Fellowships and programs...
   Response Scale: A lot weaker, A little weaker, About the same, A little stronger, A lot stronger
   a) ...in terms of the benefits offered, the KICP Postdoctoral Fellows program is:
   b) ...in terms of resulting professional advantages, the KICP Postdoctoral Fellows program is:

30. Were there any challenges or drawbacks to the KICP Postdoctoral Fellowship program in contrast to other programs?

31. Are there unique advantages of the KICP Postdoctoral Fellows program in comparison to other leading fellowship opportunities?

34. Please use the space below to provide any additional comments that you have about the KICP Postdoctoral Fellows Program.
Appendix D: KICP Faculty Mentorship Survey

Introduction

1. For how many KICP postdoctoral fellows have you served as a mentor - i.e., as a research advisor or close collaborator?

2. On average, how much time does it take you to mentor postdoctoral fellows?
   - less than one hour per quarter
   - 1-3 hours per quarter
   - 4-10 hours per quarter
   - More than ten hours per quarter

3. For how many KICP postdoctoral fellows have you served as an official KICPCareer Mentor, as assigned through the Fellows MA?

Career Mentorship Experiences

4. The questions in this section refer specifically to your experiences serving as an official KICP Career Mentor, as assigned through the Fellows MA.

5. How or why did you become a career mentor for a KICP Postdoctoral Fellow?

6. On average, how much time does it take you to serve as a career mentor?
   - less than one hour per quarter
   - 1-3 hours per quarter
   - 4-10 hours per quarter
   - More than ten hours per quarter

7. Which of the following best describes your awareness of the specific expectations for being a career mentor when you first got involved?
   - I was not aware of the specific expectations for being a career mentor.
   - I had some awareness of the specific expectations for being a career mentor.
   - I was very aware of the specific expectations for being a career mentor.

8. To what extent has your career mentorship had an impact on the postdoctoral fellows that you have mentored?
   - No impact at all
   - Moderate impact
   - Great impact

9. Describe your mentoring style (e.g., How do you approach mentoring? What help have you offered? What questions have you asked? What advice have you offered?).

10. What have been your greatest contributions or accomplishments as a career mentor?
11. Please use the space below to describe any advantages of being a career mentor, including impacts that the experience may have had on you personally or professionally.

12. Please use the space below to describe any challenges that you faced as a career mentor.

13. Do you have any suggestions for how to improve the career mentorship program specifically?

Postdoctoral Fellows Mentoring Experiences in General
The questions in this section refer to your experiences mentoring fellows as a research advisor or close collaborator.

14. To what extent have your mentorship experiences in general had an impact on postdoctoral fellows?
   o No impact at all
   o Moderate impact
   o Great impact

15. What have been your greatest contributions or accomplishments as a mentor to KICP postdoctoral fellows?

16. Please use the space below to describe any challenges that you have faced in mentoring KICP postdoctoral fellows.

17. How helpful would each of the following mentor supports or resources be?
   RESPONSE SCALE: Not helpful at all, Not very helpful, Somewhat helpful, Extremely helpful
   a) Readings or handouts that provide mentoring tips
   b) A short training program or orientation session for mentors
   c) Periodic reminders or prompts to reach out to the fellows
   d) Having someone I could turn to if I had questions about how best to mentor a specific fellow
   e) Additional compensation for being a mentor

The Big Picture/Final Thoughts

18. To what extent (and how) do you think the postdoctoral fellows program helps to transform and advance cosmology and particle physics? (i.e., furthering the primary goal of KICP).

19. What’s special about KICP and the environment that it offers to faculty, students and postdoctoral fellows? Is the whole (i.e., the entire fellows experience) greater than the sum of all the “parts” that KICP offers?

20. Please use the space below to share any recommendations you have for the KICP postdoctoral fellows program in general and/or additional comments.