Improving access to careers beyond HEP

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For various reasons many young HEP postdocs and PhDs seek employment outside academia. Many find jobs in the technology, healthcare, and financial sections. It is common to hear of previous HEP personnel working for software providers, hedge funds, investment companies, or as science journalists, writers, communicators, or for non-profit organisations. In these positions HEP skills like computer programming, data analysis, math, statistics, grasp of the scientific process and complex problem solving ability are very applicable. For typical faculty/academic positions the job preparation process is more familiar but for non-HEP jobs most people find themselves in an unchartered territory, especially from a job preparation point of view. Besides personal or word-of-mouth contacts, an organised way of gaining direct knowledge about the requirements and preparation for these jobs is non-existent. One advantage that HEP has over other physics research areas is a highly collaborative nature that can play to the advantage of seeing this as a common issue and its solution helping the entire field. ***The goal of this LOI is to study and identify ways to make the process of transition to industry jobs more smooth and transparent***. This will entail communicating with and involving HEP alumni who have moved to industry; job postings and job matching workshops; workshops for supervisors and postdocs on industry job prospects; and developing or exploring existing portals or tools to achieve the above purpose.

Challenges, Skills and Mentoring

One big challenge while seeking non-HEP jobs is that there is no portal to communicate with HEP alumni working in the industry. This seems like an alien world, hard to communicate with despite the fact that our skills are sought after in industry. However, communication and networking are key to access non-HEP jobs. There do exist portals like LinkedIn for employers and job seekers. Nevertheless, many job seekers working in HEP do not know contact information of our alumni. In addition, our alumni do not have a direct, and perhaps centralised, way to communicate with prospective job seekers from HEP effectively and quickly. There is no HEP alumni database. Any existing effort may rely solely on the goodwill of individuals. In other words, despite a need to hire and be hired, a matching mechanism is almost non-existent.

There are good examples of HEP community efforts like the *Inspire* database for HEP publications and *arXiv* for fast communication of physics results. These community efforts could be extended to design an alumni database for efficient networking. A good example comes from CERN (https://alumni.cern). We should explore possible solutions to achieve networking to facilitate non-HEP job seeking and the hiring process.

It is clear that skills that industry is looking for in a job candidate must be highlighted in the CV but what these are and how to write/highlight them requires proper guidance from experienced people. For example, Industry jobs may not care for (or understand) details of a Higgs physics analysis but would certainly care for experience in Machine Learning (ML), applied to signal searches and

background reduction. However, it may be hard for a non-HEP person to understand how the HEP domain-specific application of ML was effective in improvements of discoveries; the industry language of metrics and deliverables may also not overlap with ours; and the fact that the relevant work was conducted within a large collaboration may render it hard for an outsider to identify and appreciate an individual postdoc's relevant work. Among other issues that should be addressed by postdocs applying to industry positions is the presentation of additional skills that may be crucial to recruiters, like time management and the ability to meet deadlines, that our postdocs may not be well-equipped to show. Finally, writers of recommendation letters need experience with how to cater their letter towards non-HEP jobs.

[1]https://www.aip.org/statistics/reports/physics-phds-ten-years-later-success-factors-and-barriers-career-paths
[2] https://gradcareers.cornell.edu
[3] https://www.spsnational.org/career-resources/career-pathways
[4] https://www.ed.gov/stem