**SPONSORING SCIENTIST STATEMENT**

**1. The research and skillsets of the sponsoring scientists are complementary and together provide excellent coverage given Dr. Rominger’s interests. Sponsoring scientist Guralnick’s lab** focuses broadly on the use of historical and modern data drawn primarily from museum collections in order to determine evolutionary and ecological processes that explain how biodiversity is organized across the planet. Guralnick’s work has a very strong informatics focus, especially provisioning and use of Big Data from global biocollections, digitization, and mobilization efforts to assemble a global view on biodiversity and its gaps. **Research in the White Lab** is highly complementary, emphasizing the use of large ecological, remote sensing, and environmental datasets to model and make predictions for ecological systems across scales. White's work has a strong focus on integrating these datasets with ecological theory to evaluate the empirical performance of theory in different contexts and use that information to improve theoretical predictions. The White lab also has a strong record of training scientists in computation and data analysis through its active role in multiple international training efforts including Software Carpentry and Data Carpentry.

**Current and Pending Support in Guralnick and White Labs.**

*R Guralnick, current NSF*: **1)** Collab. Research: ABI DEVELOPMENT: Notes from Nature: Advancing a Next Generation Citizen Science Platform For Biocollection Transcription, Lead PI, 8/15-7/18; **2)** Collab. Research: ButterflyNet-an integrative framework for comparative biology, Co-PI, 01/16/-12/20, **3)** Collab. Research: VertLife Terrestrial: A complete, global assembly of phylogenetic, trait, spatial and environment characteristics for a model, Co-PI, 10/14-9/18; **4)** NSF, Collab. Research: Advancing Map of Life's Impact and Capacity for Sharing, Integrating, and Using Global Spatial Biodiversity Knowledge, Co-PI, 3/14-2/17; **5)** Dimensions: Collab. Research: Assembly and evolution of the Amazonian biota and its environment: an integrated approach. Collaborative PI 8/12-7/16.

*R Guralnick pending:* **1)** Collab. Research: Bilateral BBSRC NSF/BIO: ABI Development: An Online Workbench for Integrating, Visualizing and Analyzing Phylogenies, Range Distributions and Traits. Collaborative PI, 4/16-3/20. **2)** Collab. Proposal: ABI Innovation: CreatureFeatures: a toolkit for aggregating and annotating trait data. Co-PI, 4/16-3/19. **3)** Collab. Research: DIGITIZATION TCN: Northern range limit dynamics of beetles and host plants across the Great Lakes floristic tension zone. 7/16-6/20. **4)** Mobilizing Archaeology Data Through VertNet. Co-PI,1/16-12/16.

*E White, current:* 1) Moore Foundation Investigator in Data-Driven Discovery, Gordon and Betty Moore Foundation, Sole PI, 12/14-12/19. 2) SG: Distinguishing between core and transient species: new insights into the determinants of species richness, National Science Foundation, Co-PI, 3/14-3/16. 3) CAREER: Advancing macroecology using informatics and entropy maximization, National Science Foundation, Sole PI, 2/10-2/15.

*E White, pending:* None

**2. Complementary aspects of research and training plan given ongoing research of the sponsors.**

One of the key advances needed for supporting the full use of museum specimen records in ecology is to leverage novel modeling approaches to overcome limitations in assessing sampling effort and intended sample coverage. Rominger's PhD work focused on building and testing ecological theory in an evolutionary context using principles from statistical mechanics. His research highlighted the importance of evolutionary history in driving contemporary biodiversity patterns and suggested that specific mechanisms could lead to real world departures from idealized theoretical predictions. These mechanistic hypotheses have yet to be tested and leveraging large scale data from varied sources (biocollections, citizen science, phylogenetic studies) is the ideal avenue for testing them.

Guralnick and White each bring critical skills and complementary research interests that will help Dr. Rominger to complete his postdoctoral research and training. Both sponsoring scientists bring **strong backgrounds in working with, and building tools for access and use of biodiversity data**, and will help Dr. Rominger learn these skills, which are key to his research project. Both also **teach on topics related to Global Change** Biology, with broad overlap in general theory and approach but with different emphases. This provides a unique opportunity for Rominger to get needed experience helping – in a limited role given his strong emphasis on research productivity – to develop course content and lectures. **Guralnick** has specific expertise in working with large digitized museum collections, and will focus training especially on utilizing big data stacks for leveraging hundreds of millions of point records from biocollections and citizen science observation data, and developing new approaches to accumulate, store, and integrate key trait measurements from vertebrate and butterfly collections records. Guralnick will also work with Rominger on data cleaning pipelines to assure the highest quality data going into analyses and will assure that Rominger has a skillset necessary to be successful. **White’s lab** provides a strong foundation in integrating large amounts of data with ecological theory. This includes efforts across the data stack from developing software to make accessing data easier for end users to conducting intensive analyses of ecological theory across thousands of sites simultaneously using likelihood and hierarchical modeling approaches.

*Personnel with whom the applicant will work:* Rominger will primarily work with Guralnick and White. Both labs have strong mentoring records, and work hard to cultivate diversity in their communities. Guralnick is situated within the Florida Museum of Natural History and its strong community of museum expertise and research scientists, especially so given the unifying activities of iDigBio. Through a postdoc at UF, Rominger will be also able to leverage not only the local expertise within both labs but also the larger community of shared knowledge in the Museum and more broadly with White and the group in Wildlife Ecology and Conservation. In White’s lab, Dr. Rominger will benefit from interacting with the full-time software engineer in relation to his software development efforts, with David Harris, a postdoc with expertise in hierarchical modeling and machine learning, and with a diverse array of graduate students interested in answering large scale questions using museum and citizen science data. Rominger would work across both labs, with space provided in both Dickinson, where Guralnick is situated and runs both an informatics lab and wet lab, and WEC Building 150 where White runs an interdisciplinary research group with informatics, dry lab, and collaboration facilities. When considered in total across both labs, Rominger will have the opportunity to connect to a strong pool of post-docs, graduate students, undergraduate researchers, and software developers, further leveraging expertise he needs.

**3. Mentoring plan in research, teaching, and career development.**

Guralnick and White will co-mentor Rominger following the guidance of the National Academies of Science and Engineering on how to enhance the postdoctoral experience ([http://www.nap.edu/openbook.php?record\_id=9831&page=3](http://www.nap.edu/openbook.php?record_id=9831&)). We provide more details on critical aspects of the mentoring plan not covered elsewhere below.

*Co-development of an individual plan that defines the expectations and goals of the postdoc*: At the beginning of the fellowship period Guralnick and White will meet with Rominger to develop a plan that will provide the basis for regular self-assessment, formal evaluation, and activities during the project. This plan will be updated regularly via meetings between the postdoc and sponsoring scientists.

*Explicit acknowledgement that career development is an integral part of a post-doctoral position and strong lab and institutional support to further career development:* We will encourage attendance at seminars, workshops, skills training, and professional development events at both the University of Florida and other institutions. There will be a specific emphasis on opportunities covering professional activities within a University Museum setting, the service responsibilities of faculty, teaching effectiveness and strategies for promoting student-centered learning, and how to find funding and next-step career opportunities.

*Strong support for Rominger’s attendance at core meetings:* Dr. Rominger will be encouraged to attend core disciplinary meetings such as the International Biogeography Society (IBS) biannual congress and Ecological Society of America (ESA), to promote and receive feedback on his work and gain exposure to cutting-edge research. Rominger will also be encouraged take part in activities at iDigBio, which will provide an unparalleled opportunity for him to get first-hand experience in 21st century museum expertise.

*Quarterly postdoctoral mentoring reviews to examine the status and progress towards career goals:* These reviews will address concrete project management and career development topics, e.g. developing rational timelines, major roadblocks, and identification of opportunities to exercise leadership, etc. We will together provide Rominger with an annual progress summary for potential use in reports to NSF.

**4. Role of the Sponsors in the proposed research and training.**

*Research training:* Both White and Guralnick are actively engaged with all members of their labs. Both sponsors will plan to meet weekly with Dr. Rominger to provide training in the skills needed to accomplish the proposed research and feedback on research direction and progress. However, more is needed, including co-development of more detailed research plans, active work with Dr. Rominger on developing statistical tools, checks on software development, and on trouble-shooting all data collection and analysis tasks, and guidance on professional development and career development as mentioned above. Dr. Rominger will participate in regular research project meetings and lab meetings across both labs to discuss his research and get needed feedback (such as pre-submission manuscript review). We anticipate that work in which we are fully involved will lead to first authored papers for Rominger with the role of advisors in such work as co-authors where warranted.

As part of our role in research and training, we will seek to connect Rominger more broadly to education and public outreach staff at the Museum as well as encourage him to take on active roles with Museum, Wildlife Ecology and Biology Department colloquium activities. A crucial part of mentoring roles is to assure he has support to build research networks that will extend beyond his post-doctoral position. Measures of success will include Rominger fulfilling his core research goals and having impactful involvement more broadly in the biodiversity informatics, data sciences and the strong statistical and ecological modeling programs offered at UF. Examples include seminar attendance, new collaborative projects, and co-authored work outside the direct sphere of the sponsoring scientists.

*Teaching training:* Training provided in teaching will involve three components. First, Dr. Rominger will be provided formal training in modern pedagogy as a participant in a Software/Data Carpentry Instructor Training workshop organized by White. These workshops provide training in general evidence based pedagogy as well as specific approaches to training scientists in computing. Second, Dr. Rominger will apply these skills by collaboratively delivering 2-day workshops in computational and data methods with White. White will actively providing advice and feedback before, during, and after the workshops aimed at improving Rominger's teaching. Finally, Dr. Rominger will learn about teaching in traditional university courses by participating in both Guralnick and White’s courses. This activity will include instruction and feedback about all stages of the teaching process from the importance of syllabi, to class preparation and execution. He will learn from and model modern pedagogical techniques used by White and Guralnick including flipped classrooms, active learning, and peer instruction. The sponsoring scientists also strongly support Rominger mentoring graduate and undergraduate students in their respective labs, a fundamentally important skill that must be transferred to the next generation of scientists. The goal is not to have Rominger “fill gaps” in the lab or merely utilize undergraduate help for projects, but to instead mentor Rominger in the art and science of this aspect of a scientist and academic’s work. The Guralnick lab currently has 6 undergraduate researchers and the White lab 1 — so there are numerous opportunities for undergrad research mentoring. Additional formal training in mentoring will come through participation in mentoring workshops at University of Florida. Finally, Rominger will work with his sponsoring scientists to assure that there is a coherent plan for outreach. We have already discussed appropriate activities such as Rominger leading a Science Cafe at the FLMNH about biotic homogenization and its consequences.

**5. Limitations placed on the Fellow following the fellowship.**

Given that this work, while complimentary with all labs, is clearly very much his own, we foresee no issues at all with limitations regarding Andy’s next-step work that he will take away from his time at UF. If anything, we expect to train someone who will be a tremendous colleague with whom we will continue work past his post-doc.