Data Management Plan

The *XXX*  team will put in place the following data policies and procedures in order to make available the details and results of [experimental and computational research, interview and focus group data, observational data etc.] can be sufficiently documented so work can be reproduced by other researchers.

The PI will have full oversight of this data management. All Co-PIs and Senior Personnel will oversee data management activities related to their specific research activities. The PI ensures the implementation of the data management plan at each reporting period and that others are fulfilling their responsibility. The PI is also the contact for providing public access to data upon request. Data and intellectual property generated under this project will be administered in accordance with Rutgers University IP Policies and NSF Data Management Guidelines.

## Types of Data

* **XXX data:** Theory, algorithms, modeling protocols, code, interview data, focus group data, interview transcripts, focus group transcripts, and simulation results related to xxx materials and devices.
* **Experimental raw data:** xxx material design, process constraints, xxx device design rules, laboratory procedures, optical images, high resolution electron microscope images and other characterization data, manufacturing guidelines, interview transcripts, focus group data, observational data.
* **Experimental samples**: Samples prepared for electrical and optical measurements, samples prepared for microscopy and spectroscopic analysis.
* **XXX products**: Materials and XXX provided to other xxx members and external collaborators, the XXX will be...
* **Curriculum materials:** Online lectures, student handouts, instructor manuals, and other documents.

Data will then be used to create graphs, tables, and plots for presentation in scientific publications. All human subject data will be handled in accordance with IRB requirements and recommendations. Confidentiality for interview data and focus group data will be preserved per IRB protocols.

## Standards for Data Formats and Metadata

Any data generated in this project will be stored in easily accessible and widely used formats such as word processing documents, spreadsheets, presentations, and databases. Any files created with proprietary software or outputs from simulation models will be stored as text, pdf, or HTML files. Images will be stored as JPEG or TIFF files. Experimental metadata such as instrument design, range, precision, and unique identifiers will be presented in tabular format both in spreadsheet and PDF format. Metadata will be included as file headers or in supplementary “Readme” files as needed. All data will be stored in an indexed database (e.g., ACCESS), and used to create a subset of data to be shared in a user-friendly format as the xxx database.

We will pursue active partnership with xxx via the use of the open platform XXX that will enable us to share open data at no cost in a findable, accessible, and reusable format. This platform will help us store, structure, and share our data and ultimately make faster and more efficient research. The database is broken up into XXX that display the properties of a XXX as well as type of data (e.g., property, composition, preparation, method, files, references, etc).

## Policies for Access and Sharing

Internally, data sharing will begin immediately and will continue throughout the project to serve as real-time updates and as a means to increase effective communication between team members. This will be done via email, departmental servers, and XXX’s contractual agreement with [file sharing site] that provides unlimited storage and secure data sharing to XXX faculty/staff and their external collaborators. Per university policy, departmental servers are subject to daily backups to prevent data loss in the event of a disaster. The XXX campuses have fully secured Ethernet and Wi-Fi services to facilitate data storage and transfer. In cases of changes to the roles and responsibilities of the personnel involved (such as graduation or other separation), the faculty are responsible for preserving and maintaining previously collected data.

Curricular or related documents that are produced through this award will be available via the project team using a direct email request.

If any experimental data is collected as part of this award, research data will remain in our secured servers, computers, and password protected areas for internal sharing. When the project is completed or the results published, all of the theoretical, simulation, experimental, and raw data will be available to anyone in the research community upon request to the PI. The availability of these data will be mentioned in relevant publications. Exceptions are data involving proprietary information or patent applications. Experimental samples will be stored or discarded per the university’s security and safety guidelines.

Interview, focus group and observational data will be de-identified when quoted directly to protect the identity of the individual, identifying information will be stored separately per IRB protocols. Data will be reported in aggregate to preserve confidentiality.

### Intellectual Property

The policies for generating, managing, protecting, sharing, and transferring intellectual property (IP) rights are already in place at XXX. Professional staff from Innovation Ventures at Rutgers will assist with management and transfer organization for RU, will work with the researchers in the development (e.g., IP filing), protection (e.g., non- disclosure agreement), and licensing of intellectual property to advance innovations on the path to market.

## Period of data retention

No specific limit is set at this time for the length of data retention. The data will be kept for at least the duration of the project plus at least three years. Data that support patents will be retained for the entire term of the patent. However, the data base is extensible and there is sufficient storage space for many decades worth of data. The raw experimental and statistical data are saved on SQL database and on a virtual server. The backup of the data repositories is managed by local and university level technology offices, which incorporates multiple levels of redundancy.

## Data dissemination and policies for public access, sharing, and publication

The PIs will share the results of the activity with other researchers within a reasonable time in order to conform to the NSF policy on dissemination and sharing of research results. The public release of data will be at the earliest reasonable time. The main venues for data dissemination will be the disclosure of results to the scientific community through presentations in disciplinary scientific meetings, with subsequent long-term standard publication of scientific results in a) peer reviewed publications and b) academic theses both of which will be accessible to the public. To ensure the quality of the data, the PIs plan to release any and all data only after the peer review process. Journals increasingly allow the upload of supplementary information and where ever possible the data used to generate graphs and tables in publications will be uploaded to the publisher’s website so that it is immediately available to the reader.

Before disseminating results, XXX will ensure that the researchers’ IP is protected. The team will encourage participating researchers and partners to identify existing IP being used, develop joint IP where appropriate, and develop agreements whereby member institutions have access to each other’s IP for use in joint projects and technology transfer outside XXX.