

## WORK PLAN – SCOPE OF SERVICES

### *The LONI Institute: Advancing Biology, Materials, and Computational Sciences for Research, Education, and Economic Development*

#### A. Goals and Objectives

The LONI Institute (LI) has five overarching goals:

- 1) **Talented Workforce.** The LONI Institute (LI) will recruit dozens of excellent faculty, staff, and students, and train hundreds of others, catalyzing the development of a highly skilled IT-oriented workforce crucial for economic development.
- 2) **Competitiveness.** State research institutions will become significantly more competitive for federal funding, recruitment and retention of the best people, and attracting companies.
- 3) **Educational System.** Education will be transformed with computational science infused into the curriculum at all levels, and in many disciplines.
- 4) **Economic Development.** Activities will be harnessed for economic development for Louisiana, with university-industry cooperative research programs and centers of excellence flourishing in five years.
- 5) **Self-Sustaining and Growing.** The LI will harness and amplify previous investments through cooperation between its members for greatly enhanced research, education, and economic development.

The major objectives that will lead to success in meeting these goals are the following:

- 1) Hire new faculty: Create 12 new faculty positions across the 6 LONI Institute sites. These positions - entitled “LI Fellows” - are funded 50% through P-KSFI funds and 50% through institutional funding.
- 2) Engage new research staff: Recruit 6 new computational scientists across the 6 LONI Institute sites.
- 3) Support talented graduate students: Support 18 new graduate students across the 6 LONI Institute sites.
- 4) Foster economic development: Initiate student internships, industry partnerships, industry grants, and new companies. Engage an economic development professional to oversee the Institute’s economic development activities, and to oversee all economic development projects.
- 5) Initiate 80+ new research projects by project end date.
- 6) Increase collaboration among LONI sites, other Louisiana institutions of higher education, and national institutions of higher education.
- 7) Enhance statewide education and training efforts.

**\*\*See section C for a detailed measurement and evaluation plan.**

**B. Deliverables:**

June 30, 2008: First Year Project Report, and Financial Status Report  
 June 30, 2009: Second Year Project Report, and Financial Status Report  
 June 30, 2010: Third Year Project Report, and Financial Status Report  
 June 30, 2011: Fourth Year Project Report, and Financial Status Report  
 June 30, 2012: Final Project Report,  
 Sept 30, 2012: Final Financial Status Report

**C. Performance Measures**

As stated in the proposal for this project, the LONI Institute has defined numerous metrics to measure project progress and success. These metrics include the hiring of faculty and researchers, creating statewide interdisciplinary research projects and obtaining federal follow-on funding for such, developing corporate partnership programs and start-up companies, developing and following interdisciplinary and multi-institutional collaborations, and creating new educational programs. The performance measures are discussed in detail below, accompanied by project milestone estimates.

**PERSONNEL**

| <b>Objective</b>                            | <b>Metric</b>                                | <b>Success Criteria</b>   |
|---|--|---|
| LONI Fellows                                | Full-time faculty hires, 2 per institution   | 6 by EO Y2; 12 (total) by EO Y3. Nucleation of 6 new multi-institutional research groups by Y3. |
| Development Coordinator                     | Individual hired                             | 1 hire, Fall Y1; new hire in 6 months if position becomes vacant                                |
| LI Graduate assistantships                  | Graduate students funded by Institute        | 6 in each 2 year period; 18 students total over life of project                                 |
| LI Computational Scientist                  | Individual hired                             | 6 hired in Fall Y1; new hire in 6 months if position becomes vacant                             |
| LI-seeded growth of LONI to national status | Receive federal funding for additional staff | 12 staff funded from federal sources by EOY5  |

**RESEARCH**

| <b>Objective</b>              | <b>Metric</b>              | <b>Success Criteria</b>  |
|-------------------------------|----------------------------|--|
| LONI Computational Scientists | LI projects underway       | 12 new projects underway by EOY1; 18 new projects per year thereafter; at least 80 total; 25% projects permitted to be continued for new advances; 25% corporate |
| State faculty, staff, and     | Number of applications for | All LI projects use LONI, 12   |

|   |   |   |
|---|---|---|
| student trained and using LONI infrastructure | time, projects using compute, data, network, and software services            | personnel trained each year from each LI member, medical centers and community college system, 400 active LONI users from State by Y5   |
| National proposals                            | LI-funded faculty-led national funding agency proposals, submitted and funded | 50% of LI projects lead to proposals to agencies outside State (e.g., NSF, DOE, NIH) or industrial funding in Y2 and subsequent years; 2 proposals submitted per year, per LI Fellow, starting in Y2, 96 total, 10 new LI Fellows projects funded total |
| Research computing project resources          | Successful computational infrastructure/cycle applications                    | 50% of projects lead to nationally-judged computational infrastructure awards in Y2 and subsequent years  |
| Research publicity                            | Invited presentations and lectures outside LA                                 | Each project leads to 2 presentations/lectures per year starting in Y2; 160 total   |
| Scientific & Engineering Results              | Peer-reviewed conference and journal publications that acknowledge LI support | 3 per LONI Fellow per year; 1 per LI project per year; over 150 total   |
| National Computing Center                     | LI personnel successful in obtaining federal funding                          | 1 national federally-funded center, funded with at least \$70M  |
| LI research impact                            | New non-LI-funded faculty working with LI                                     | 6 per year starting in Y2   |

### ECONOMIC DEVELOPMENT

| <b>Objective</b>                              | <b>Metric</b>   | <b>Success Criteria</b>   |
|---|---|---|
| Student internships with companies            | Number of placements                                  | 2 students placed each year; 20 total (not all will be LI-funded)   |
| Pilot program with Council on Competitiveness | Program established                                   | 15 students at community college trained in CS each year, 30 total placed in companies, 10 enter universities for continued study in CS |
| Industrial partnerships                       | Partnerships in projects with industrial partner (any | 25% of total projects; 20 partners in 5 years   |

|                                |  |  |
|--------------------------------|--|--|
|                                | company who has joint project with LONI) |  |
| Industry grants                | Sponsored research from companies        | 25 by Y5 across all sites  |
| Centers of Excellence (UIRC's) | Number formed with multi-year duration   | 1 by EOY3, 3 by EOY4, 5 by EOY5, all industry-funded with at least 1 industry staff member on-site (across all LI sites) |
| New companies formed           | Number of new companies                  | 1 by EOY3, 3 by EOY4, 6 by EOY5  |

### COLLABORATION

| Objective  | Metric                               | Success Criteria   |
|--|--------------------------------------|--|
| Between computational scientists and biologists, materials | Joint papers and proposals           | 2 interdisciplinary papers (including preprints from a LI preprint series) per group per year; 1 at interface between bio, materials, computation per group per year; 50% of proposals have 2 of 3 disciplines |
| Inter-university   | Number of joint papers and proposals | 2 papers, 1 proposal (including preprints from a LI preprint series) per group per year  |
| Inter-university   | New joint projects                   | 30 new multi-university projects proposed to SC per year   |
| National   | Visits to national labs              | 3 students, 2 staff, and 6 faculty with visits to national labs per year, 2-3 each summer across all sites   |

### EDUCATION AND TRAINING

| Objective           | Metric                                       | Success Criteria   |
|---------------------|--|--|
| Statewide education | HD video courses offered                     | 4 courses per year with students from 4 universities, and 20 total students per course receiving credit.                 |
| Statewide training  | Number of training workshops, people trained | Initially 2 HPC & CSs workshops offered per year, increasing to 4 by Y5; at least 50 people trained each year, 400 total |

|                       |   |  |
|-----------------------|---|--|
| High school education | Summer camps                                  | 1 per year for LI members  |
| High school courses   | Teachers offer LI-related material in courses | 10 new teachers offer classes with LI material each, year starting in Y2 |

**D. Monitoring Plan**

We will submit regular annual reports to the Board of Regents as an evidence of timely progress. These reports will include detailed information on the items completed during that year, items which are still in progress, publications derived from the work supported by this proposal, funding efforts pursued by the PI and the status of such, and information on how the allocated funds are spent.

The proposed reporting schedule is given below:

- June 30, 2008: First Year Project Report, and Financial Status Report
- June 30, 2009: Second Year Project Report, and Financial Status Report
- June 30, 2010: Third Year Project Report, and Financial Status Report
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**E. Utility of the Final Product**

The statewide “LONI Institute” (LI) will become a self-sustained and growth-oriented economic development powerhouse focused on computational and scientific research essential for solving challenging problems in materials science and biology. The LI will build on the foundations laid by the \$25M annual State Vision 2020 IT initiative and the \$50M Louisiana Optical Network Initiative (LONI), which already connects LI members with a 40-Gbit optical network. Reaching far beyond the scope of a single research problem, LI will provide major scientific and economic benefits in areas important to Louisiana.