**Current and Pending Support**

***Alexei Bazavov***

Current

| | |
|---|---|
| Sponsor: | Department of Energy |
| Award Number: | DE-SC0012704 |
| Project/Proposal Title: | SciDAC-4: Computing the Properties of Matter with Leadership Computing Resources |
| Total Award Amount: | $550,000 |
| Person-Months: | 0 |
| Total Award Period Covered: | 9/1/17 – 8/31/22 |
| Location of Project: | Multi-institutional, led by Jefferson Laboratory, MIT and Brookhaven National Laboratory; subcontract at MSU |
| Brief Description of Project: | Code development for lattice QCD calculations |
| Overlap with Proposed Research: | none |
| Sponsor: | National Science Foundation |
| Award Number: | PHY-1812332 |
| Project/Proposal Title: | Heavy Quarkonia as Thermometer of Quark-Gluon Plasma |
| Total Award Amount: | $240,000 |
| Person-Months: | 1 month SUM |
| Total Award Period Covered: | 8/15/18 – 8/31/21 |
| Location of Project: | MSU |
| Brief Description of Project: | Study of the heavy quark bound states in quark-gluon plasma applying lattice QCD |
| Overlap with Proposed Research: | none |
| Sponsor: | Department of Energy |
| Award Number: | DE-SC0019139 |
| Project/Proposal Title: | Foundations of Quantum Computing for Gauge Theories and Quantum Gravity |

| | |
|---|---|
| Total Award Amount: | $127,325 |
| Person-Months: | 0 months |
| Total Award Period Covered: | 10/1/18 – 9/30/20 |
| Location of Project: | Multi-institutional, lead by the University of Iowa, subcontract at MSU |
| Brief Description of Project: | Foundational aspects of quantum computing as applied to quantum field theories and quantum gravity, study of tensor renormalization group methods with applications to quantum computing |
| Overlap with Proposed Research: | none |

Pending

| | |
|---|---|
| Sponsor: | Department of Energy |
| Project/Proposal Title: | From Quarks to Stars; A Quantum Computing Approach to the Nuclear Many-Body Problem |
| Total Award Amount: | $1,000,000 |
| Person-Months: | 0.12 academic |
| Total Award Period Covered: | 10/1/19 – 9/30/22 |
| Location of Project: | Michigan State University |
| Brief Description of Project: | This proposal aims at studying and applying recent developments of algorithms and methods from quantum computing and quantum information theory to studies of complex and strongly interacting nuclear many-particle systems. The proposal aims at developing new methods for studying systems that span from strong force simulations of quarks and gluons to many-body methods applied to the equation of state of dense matter. The proposal aims at developing interdisciplinary research projects that unites researchers in quantum computing and quantum information theory with theorists working on interacting many-particle methods applied to nuclear physics. |
| Overlap with Proposed Research: | this is the proposed project |