

MEMORANDUM OF UNDERSTANDING  
BETWEEN

The Regents of the University of California, as Management and Operating  
Contractor for  
Lawrence Berkeley National Laboratory

AND

The Department of Physics, University of California, Berkeley,

AND

Interdisciplinary Theoretical and Mathematical Sciences Program, RIKEN,  
Japan

CONCERNING

Collaboration, Cooperation, and Exchanges in the Fields of Theoretical Physics,  
Nuclear Astrophysics,  
and Related Computational Science

This Memorandum of Understanding (MOU) is between The Regents of the University of California (hereafter "The Regents"), in its capacity as the manager and operator of the Lawrence Berkeley National Laboratory (hereafter "LBNL"), the Department of Physics, University of California, Berkeley (hereafter "UCB Physics"), and the Interdisciplinary Theoretical and Mathematical Sciences Program, RIKEN (hereafter "RIKEN iTHEMS").

LBNL is a U.S. Department of Energy (DOE) National Laboratory operated by The Regents pursuant to DOE Contract No. DE-AC02-05CH11231. UCB Physics is a University of California, Berkeley academic department. RIKEN iTHEMS is an international research program administered through RIKEN, a National Research and Development Institute in Japan.

The Regents, UCB Physics, and RIKEN iTHEMS are collectively herein referred to as the "Participants" or individually as a "Participant."

**1. Objective**

The Participants intend to explore future collaborations in the fields of theoretical physics, nuclear astrophysics, and related computational sciences.

**2. Proposed Areas of Collaboration**

The Participants intend to collaborate in the following areas

- a) lattice QCD and other computational many-body theory;
- b) tests of fundamental symmetries using nuclei and atoms; and
- c) nuclear and neutrino astrophysics.

The scope of activities and cooperation may be changed or extended upon mutual written consent of the Participants.

### **3. Proposed Forms of Collaboration**

The Participants expect to collaborate through:

- a) Mutual visits including the exchange of research staff, graduate students and post-doctoral fellows;
- b) Joint workshops, seminars and other similar activities; and
- c) Exchange of scientific materials, publications, and information.

Any future collaborative research must only be undertaken pursuant to an appropriate written agreement therefore.

### **4. Proposed Mechanisms of Collaboration**

- a) To administer the implementation of this MOU, each Participant should designate one or more principal coordinators to be in charge of the collaboration, through whom all requests and plans of that Participant should be made.
- b) The principal coordinators may hold meetings when necessary to discuss matters related to the collaboration under this MOU.
- c) The principal coordinator for The Regents is Prof. Barbara Jacak. The principal coordinator for UCB Physics is Prof. Wick Haxton. The principal coordinator for RIKEN iTHEMS is Dr. Tetsuo Hatsuda.
- d) A Participant may change its designated principal coordinator upon written notice to the other Participants.

### **5. Commencement, Modification, Duration, and Discontinuation**

- a) Cooperative activities under this MOU may commence as of the last date of signature by the Participants and continue for a period of three (3) years thereafter unless discontinued in accordance with paragraph b) of this section or extended in accordance with paragraph c) of this section.
- b) The Participants may discontinue this MOU at any time by mutual written consent. Alternatively, a Participant that wishes to discontinue its participation in this MOU should endeavor to provide a minimum of ninety (90) days prior written notice to the other Participants.
- c) This MOU may be modified or cooperative activities hereunder extended for an additional period by mutual written consent of the Participants.

### **6. Exchange of Information**

The Participants do not anticipate the exchange of business-confidential information or the creation of intellectual property. If the Participants determine that a particular activity may lead to the exchange of business-confidential information or the creation of intellectual property, they should consult with each other and enter into an appropriate written agreement therefor.

### **7. General Provisions**

- a) This MOU does not create any legally binding obligations between the Participants.

- b) Each Participant should conduct the activities contemplated by this MOU in accordance with all applicable laws, regulations, and other requirements to which it is subject, including by way of illustration and not by way of limitation, export control laws; environmental, health, and safety laws and regulations; and international agreements to which its Government is party.
- c) The conduct of cooperative activities contemplated by this MOU is subject to the availability of funding, personnel, and other resources.
- d) Each Participant is responsible for the costs it incurs in participating in cooperative activities under this MOU.

Signed in triplicate.

Signed for The Regents

Signed for RIKEN and iTHEMS

Michael WithereLL  
WITHERELL Michael  
Laboratory Director  
Lawrence Berkeley National  
Laboratory

Kotani Motoko  
KOTANI Motoko  
Executive Director  
RIKEN

Date: 8/11/17

Date: 8/24/17

Place: Berkeley, CA, USA

Place: Wako, Saitama, Japan

Signed for Dept. of Physics, UCB

Wick Haxton  
HAXTON Wick  
Chair  
Department of Physics  
University of California, Berkeley

Hatsuda Tetsuo  
HATSUDA Tetsuo  
Program Director  
iTHEMS, RIKEN

Date: 8/17/17

Date: 8/3/17

Place: Wako, Saitama, JAPAN

Place: Berkeley, CA USA