

MEMORANDUM OF UNDERSTANDING

Between

**JEFFERSON SCIENCE ASSOCIATES, LLC,
THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY**

and

THE UNIVERSITY OF MANITOBA

FOR COOPERATION IN PARITY-VIOLATING ELECTRON SCATTERING IN HALL A

Jefferson Science Associates, LLC, the management and operating contractor of the Thomas Jefferson National Accelerator Facility (JSA/Jefferson Lab), for the United States Department of Energy, under U.S. DOE Contract No. DE-AC05-06OR23177, located at 12000 Jefferson Avenue, Newport News, Virginia 23606, and the University of Manitoba located in Winnipeg R3T 2N2 Canada, R3T 2N2 Canada, collectively herein the "Participants,"

SHARING an interest in collaborating on the use of parity-violating electron scattering to study nuclear and nucleon properties,

HAVE REACHED THE FOLLOWING UNDERSTANDING:

I. OBJECTIVE:

1. The Participants intend to collaborate in the area of parity-violating electron scattering in Hall A, in particular the development of a new Compton electron detector, the pre-conceptual design of the spectrometer and detectors for the proposed MOLLER experiment (E12-09-005), and design of the PREX and CREX experiments (E12-11-101 and E12-12-004, respectively).
2. The entities expected to collaborate in activities contemplated by this Memorandum of Understanding (MOU) include:
 - a. JSA is a Southeastern Universities Research Association/Computer Sciences Corporation, a limited liability company created specifically to manage and operate Jefferson Lab. The DOE Office of Nuclear Physics within the Office of Science operates the Continuous Electron Beam Accelerator Facility

(CEBAF) as a national user facility at Jefferson Lab. CEBAF is a world-leading facility in the experimental study of hadronic matter.

- b. The University of Manitoba (MNT) is a part of the collaboration of universities and research laboratories that comprises the Qweak, MOLLER, PREX and CREX Collaborations. The Qweak experiment is a search for physics at the TeV Scale via a measurement of the proton's weak charge. For this experiment, the Manitoba group has ongoing responsibility for main detector characterization, data analysis and Compton electron detector analysis. For the proposed MOLLER experiment, the Manitoba group is responsible for the pre-conceptual design of the spectrometer and the integrating quartz detectors. The Manitoba group is also collaborating with Hall A staff on the design of the PREX and CREX experiments. In addition, the Manitoba group is responsible for the design of a new Compton electron detector. The MNT-JLab Collaboration is based on the joint research activity in Hall A on these experiments.

II. PLANNED AREAS OF COOPERATION:

Proposed collaboration may include, but is not limited to, the following:

1. University of Manitoba:
 - a. participate as a member of the Hall A collaboration,
 - b. give technical support to the design and construction of the equipment described in Section I. 1. of this MOU;
2. JSA/Jefferson Lab:
 - a. provide an appropriate on-site work environment including space, computer access, necessary training and other resources as required for all user scientists,
 - b. provide the Manitoba group members via the Hall A Group Leader access to technical facilities, such as technical and electronics shops, laboratory, stores,
 - c. provide the University of Manitoba Collaboration members access to a telephone for scientific and technical conversations, and access to conference calls with international collaborators. Personal use is to be reimbursed as required of all Jefferson Lab employees and collaborators,
 - d. provide a sufficiently detailed Statement of Work describing the goals and expectations,
 - e. keep key personnel informed of overall project status and requirements for the joint scope of work,
 - f. develop and provide a forum of regular progress updates by the personnel.

Other collaborative activities may be added by the Participants' mutual consent in writing.

III. FORMS OF COOPERATION:

Cooperation may include, but is not limited to:

1. Joint publications between the University of Manitoba team and the Hall A group at Jefferson Lab,
2. Exchange of scientists and other specialists for participating in project activities. Each Participant is to abide by the health, safety, and environmental requirements of the host Participant when on an exchange assignment at the host Participant's facility.

IV. MECHANISMS OF COOPERATION:

A. Key Personnel

1. Key personnel from University of Manitoba include Dr. Shelley Page, Dr. Michael Gericke and Dr. Juliette Mammei, who is to act as the liaison and primary point of contact for this collaboration.
2. Key personnel from Jefferson Lab include Dr. Cynthia Keppel.

V. GENERAL CONSIDERATIONS:

1. This MOU does not create any legally binding obligations between the Participants. If commitment, obligation, or transfer of funds is required, a written contractual agreement or other reimbursable arrangement is to be concluded between JSA/Jefferson Lab and The University of Manitoba to provide specific funding, obligation, and billing data.
2. The conduct of cooperative activities contemplated by this MOU is subject to the availability of funding, personnel, and other resources.
3. Each Participant should conduct the cooperation contemplated by this MOU in accordance with applicable laws and regulations to which it is subject, including privacy laws, export control laws and regulations, and international agreements to which its Government is party.

4. Each Participant is to be responsible for the costs it incurs in participating in cooperative activities contemplated by this MOU.
5. Any transfer or loan of equipment is to be implemented under a written agreement.
6. The Participants intend to acknowledge in publications all institutions that contribute to results achieved from activities contemplated by this MOU and in the manner customary for scholarly publication. Each Participant intends to utilize its institution's review procedures for all publications (to include presentations) developed under this MOU.

VI INTELLECTUAL PROPERTY

If the Participants decide to engage in future collaborative research and development, they intend to conclude, in good faith, a written agreement to provide for the adequate protection and allocation of any intellectual property created or furnished in connection therewith.

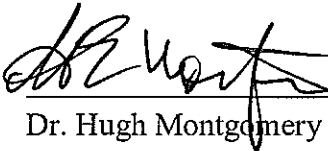
VII COMMENCEMENT, MODIFICATION AND DISCONTINUATION:

1. Cooperative activities contemplated by this MOU may commence upon signature by the Participants and continue for a five (5) year period unless discontinued in accordance with paragraph 2 of this Section VII.
2. The Participants may discontinue this MOU at any time in writing. A Participant that wishes to discontinue its participation in this MOU should endeavor to provide at least ninety (90) days written notice to the other Participant.

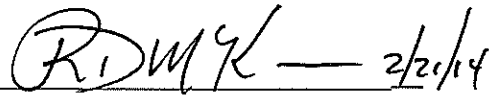
3. This MOU may be modified in writing by the mutual consent of the Participants, and may be extended for additional periods.


Signed in duplicate.


Jefferson Science Associates, LLC:

 2/24/2014
Date

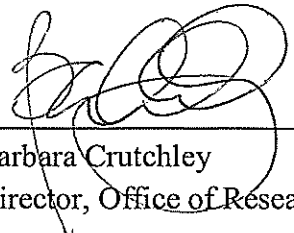
Dr. Hugh Montgomery
Director
Thomas Jefferson National Accelerator
Facility

 2/2/14
Date
Dr. Robert McKeown
Deputy Director of Science
Thomas Jefferson National Accelerator
Facility

 2/18/14
Date
Dr. Cynthia Keppel
Hall A Leader
Thomas Jefferson National Accelerator
Facility

 02/18/14
Date
Dr. Rolf Ent
Associate Director for Physics
Thomas Jefferson National Accelerator
Facility

The University of Manitoba:


Date
Barbara Crutchley
Director, Office of Research Services

The University of Manitoba
Date 12/2/14
Approved 
Legal Office

Feb 13, 2014


Date
Dr. Juliette Mammei
12/2/14