

# **COLLABORATION AGREEMENT**

## **(hereinafter referred to as the “Agreement”)**

between

**THE NA61/SHINE COLLABORATION** (hereinafter referred to as “NA61/SHINE”), an international collaboration performing measurements with the NA61/SHINE detector at the CERN SPS, represented by its spokesperson Marek Gazdzicki

and

**THE GROUPS FROM THE US INSTITUTIONS** (hereinafter referred to as “the US Groups”), represented by group leaders as given in Appendix I,

NA61/SHINE and the US groups are hereinafter collectively referred to as the " Parties" or individually as “Party”.

### **TAKING INTO ACCOUNT THE FOLLOWING CONSIDERATIONS:**

- the US groups are interested in precise neutrino flux calculations for NuMI (MINOS, NovA, Minerva) and Booster (MiniBooNE, MicroBooNE) experiments at Fermilab and the future LBNE project; these can potentially be much improved by using new hadron production data intended to be collected and analyzed within NA61/SHINE,
- the US groups started preparation of the corresponding experimental program which would extend the currently approved physics program of NA61/SHINE; this activity requires access to NA61/SHINE software and data as well as interaction with NA61/SHINE experts,
- the US groups intend to join NA61/SHINE provided the required resources (manpower for data taking, calibration, software and analysis as well as financial contributions to common fund, and the ToF detector read-out upgrade) are acquired (the corresponding LoI and Proposal to DOE are in preparation) and the new program is accepted by the NA61/SHINE collaboration, approved by the CERN SPS Committee and approved by the CERN authorities,
- NA61/SHINE recognizes the potential importance of the new measurements proposed by the US groups for the Fermilab neutrino program and therefore intends to help the US groups in the preparatory phase before their full membership in NA61/SHINE,
- NA61/SHINE operates under the terms of the “*Memorandum of Understanding for Collaboration in the NA61 / SHINE experiment for study of Hadron Production in Hadron-Nucleus and Nucleus-Nucleus Collisions at the CERN SPS*” dated 24 October 2008 between CERN and the NA61/SHINE Participating Institutions mentioned (hereinafter referred to as the “MoU”);

THE PARTIES HAVE AGREED AS FOLLOWS:

### **Article 1 - Scope of the Agreement**

In order to help the US groups in the preparation of the new program, NA61/SHINE will grant to the participants of the US groups limited membership in NA61/SHINE. This means:

- access to the NA61/SHINE EDMS, Indico and Twiki resources,
- access to the NA61/SHINE software and data,
- possibility to participate in the NA61/SHINE meetings,
- possibility to participate in the NA61/SHINE data taking,
- possibility to perform hardware and beam tests, if compatible, with the approved NA61/SHINE measurements.

The corresponding support by NA61/SHINE experts will be possible, if compatible, with their work and obligations within NA61/SHINE.

Information and results gained by the US groups due to the limited membership in NA61/SHINE are the property of NA61/SHINE and are subject to restrictions for external presentations defined by the NA61/SHINE publication policies.

### **Article 2 - Duration of the Agreement**

This Agreement shall cover a period of one year, from 01.05.2012 until and including 30.04.2013.

### **Article 3 - Amendments, Variations or Additions**

Any modification to the terms and conditions of this Agreement can be made only by means of a written agreement signed by authorized representatives of the Parties.

### **Article 4 - Suspension and Termination of the Agreement**

Suspension and termination, procedures for suspension and termination of this Agreement may be amended or supplemented only by means of a written agreement signed by authorized representatives of the Parties.

### **Article 5 – Names and logos**

Neither Party shall use the names and logos of the other Party without its prior written consent, if not directly related to the performance of obligations under this Agreement

### **Article 6 – Appendices**

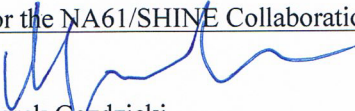
The Appendices are an integral part of the Agreement:

Appendix I: List of the US groups


Appendix I: List of the US groups

Prepared in Geneva in the English language.

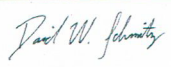
For the NA61/SHINE Collaboration

  
Marek Gazdzicki  
NA61/SHINE spokesperson  
(May 8, 2012)

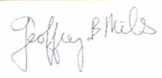
For the University of Colorado group

  
Alysia Marino  
(May 4, 2012)

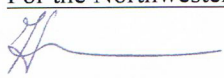
For the Fermi National Accelerator Laboratory group

  
David Schmitz  
(May 4, 2012)


For the Los Alamos National Laboratory group

  
Geoffrey Mills  
(May 7, 2012)


For the Northwestern University group

  
Heidi Schellman  
(May 4, 2012)


For the University of Pittsburgh group

  
Vittorio Paolone  
(May 4, 2012)

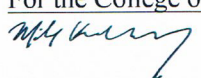
For the University of Rochester group

  
Kevin McFarland  
(May 7, 2012)

For the University of Texas at Austin group

  
Karol Lang  
(May 4, 2012)

For the College of William & Mary group

  
Michael Kordosky  
(May 5, 2012)

## **Appendix I List of the US groups**

S. R. Johnson, A. Marino, E. D. Zimmerman  
University of Colorado, Boulder, Colorado 80302, USA

D. Harris, A. Marchionni, D. Schmitz  
Fermi National Accelerator Laboratory, Batavia, Illinois 60510, USA

E. Guardincerri, C. Mauger, G. Mills, Z. Pavlovic, K. Yarritu  
Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA

H. Schellman  
Northwestern University, Evanston, Illinois 60208, USA

I. Danko, V. Paolone  
Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh,  
Pennsylvania 1526 USA

L. Loiacono, S. Manly, K. McFarland  
Department of Physics and Astronomy, University of Rochester, Rochester,  
New York 14627, USA

R. Mehdiyev, K. Lang  
Department of Physics, University of Texas at Austin, Austin, Texas 78712, USA

L. Aliaga, M. Kordosky, J. Nelson  
Department of Physics, College of William & Mary, Williamsburg, Virginia 23187, USA