User Proposal and Request for Beam Time for the NASA Space Radiation Laboratory (NSRL) or Tandem Van de Graaff Radiobiology Laboratory

Proposal No:

Date: 07/22/2015

1. Proposal Type: ☐ Animals ☐ Cells/Tissues (human or animal) ☒ Physics ☐ Other

☒ New Proposal ☐ Renewal ☐ Replacement Proposal replaces proposal no.: ☐ "Piggyback" Proposal (limited to one run only)

2. Title of Experiment: Hybrid Electronic Radiation Assessor (HERA) Verification and Validation (New)

Funding Source: *(please note Program Manager and Division)* NASA HRP Space Radiation — Bobbie Gail Swan/SA

Grant Title & Number: NASA Operational Funds FY16

Grant Start Date: 09/2015 Grant End Date: 09/2016

*Dates must cover runs being requested

3. Principal Investigator: Edward J. Semones

Department: Space Radiation Analysis Group

Institution: NASA Johnson Space Center

Mailing Address: 2101 NASA Parkway
Mailcode SD2
Houston, TX 77058

Telephone: 281-244-5107 Fax: 281-244-6625 Email Address: edward.j.semones@nasa.gov

4. BNL Account No.:
(see guidelines, page 3)

5. Beam Time Request Summary:

Requested Facility: NSRL

Requested Run: ☒ NSRL-16A (Spring 2016) ☒ NSRL-16B (Summer 2016) ☐ NSRL-16C (Fall 2016)

Requested Ions/Energies: and Times: *(please use Beam Time Calculation Table in enclosed Excel spreadsheet)*

NSRL-16A
Protons (100, 300, 400 MeV) - 8 hours, Alphas (300, 500, 600 MeV/n) - 8 hours, Carbon (300, 600, 900 MeV/n) - 6 hours
NSRL-16B
Protons (150, 250, 500, 700, 1000 MeV) - 9 hours, Alphas (250, 750, 900 MeV/n) - 6 hours, Carbon (400, 700, 1000 MeV/n) - 6 hours

6. Signature:
As Principal Investigator/Spokesperson for this proposal, I certify that everything in this proposal is accurate to the best of my knowledge and that my research team will abide by the rules and regulations of Brookhaven National Laboratory. I also certify that the work described in this proposal is not proprietary and upon completion will be published in the open literature.

PI/Spokesperson Signature: Amir Bahadori **Date:** 07/22/2015

Please sign and submit the entire completed application electronically to Ms. Leah Selva, nsrladmin@bnl.gov.

7. Detailed Beam Time Request: ***Please use Att. 6 Beam Time Calculation Table for beam requests. Sequential beam requests cannot be completed on Att.6; please submit separate calculation table, see Notes of Att. 6 for details.***

A. List equipment and materials to be provided by the beamline (items furnished by BNL):

Rotation stage
Translation table
Equipment cart
Miscellaneous cables, as needed

B. List equipment and materials to be provided by the user group (items you will bring to BNL):

Timepix-3 and HERA hardware
Radiation Area Monitors (passive dosimeters with TLD/OSL material)
Ethernet cables for pass-through
Computers for taking data
Power supplies

C. Indicate requirements for any special equipment or additional BNL facilities:

N/A

8. Personnel: Provide names, citizenships, and contact information for all personnel who will participate in experiments at BNL (use additional sheets if necessary).

Role	Name	Citizenship	Address	Telephone	Email
PI	Edward Semones	US	2101 NASA Parkway, Houston, TX 77058	281-244-5107	edward.j.semones@nasa.gov
Coworker	Martin Kroupa	Czech Republic	2101 NASA Parkway, Houston, TX 77058	281-792-8321	martin.kroupa@nasa.gov
Coworker	Nicholas Stoffle	US	2101 NASA Parkway, Houston, TX 77058	281-483-7721	nicholas.n.stoffle@nasa.gov
Coworker	Thomas Campbell-Ricketts	Great Britain	University of Houston, Houston, TX 77204		tecampb2@central.uh.edu
Coworker	Lawrence Pinsky	US	University of Houston, Houston, TX 77204	713-743-3552	pinsky@uh.edu
Coworker	Scott Wheeler	US	2101 NASA Parkway, Houston, TX 77058	281-483-7434	scott.a.wheeler@nasa.gov
Coworker	Aaron Schram	US	2101 NASA Parkway, Houston, TX 77058	281-483-8186	aaron.d.schram@nasa.gov
Coworker	Ryan Rios	US	2101 NASA Parkway, Houston, TX 77058	281-244-5782	ryan.r.rios@nasa.gov
Coworker	Amir Bahadori	US	2101 NASA Parkway, Houston, TX 77058	281-244-6761	amir.a.bahadori@nasa.gov

9. Required Approvals

A. Research Involving Animal Subjects:

Will you use animal subjects in your experiments? ☒ No ☐ Yes Species:

No. of subjects for each run:

Home Institution IACUC approval status:
If approved, provide IACUC protocol no. and approval date; if not approved, provide IACUC protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

BNL IACUC approval status:
If approved, provide IACUC protocol no. and approval date; if not approved, provide IACUC protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

B. Research Involving Cells or Tissues (human or animal-derived):

Will you use cells or tissues in your experiments? ☒ No ☐ Yes

Cell line/strain or Tissue ID:

Do you have current mycoplasma-free certification from a certified testing laboratory? ☐ No ☐ Yes
Email Ms. Paula Bennett at bennett@bnl.gov at least one (1) month prior to your experiment.

Does use of these cells/tissues require IRB approval (note: commercially-available cells/tissues are exempt)? ☐ **No** ☐ **Yes**
If you marked **Yes**, complete the following items below:

Home Institution IRB Approval Status:
If approved, provide IRB Protocol no. and approval date; if not approved, provide IRB protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

BNL IRB Approval Status:
If approved, provide IRB Protocol no. and approval date; if not approved, provide IRB protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

C. Research Involving Recombinant DNA:

Will you use recombinant DNA in your experiments? ☒ No ☐ Yes

Type of recombinant DNA:

BNL Recombinant DNA Advisory Committee Status:
If approved, provide RAC Protocol no. and approval date; if not approved, provide RAC protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

D. Research Involving Hazardous or Radioactive Materials or Procedures:
List all biohazards, chemical hazards (explosive, flammable, toxic, corrosive), and radioactive materials and procedures for using these materials in your experiments (radioactive materials do not include irradiated/activated beam line materials).

N/A

10. Transportation of Experimental Items/Samples Away from BNL

Will you take experimental items/samples away from BNL? ☐ No ☒ Yes
All radioactive/hazardous material shipments must be arranged through the BNL Hazardous Materials Transportation Group, contact Mr. Bob Colichio (colichio@bnl.gov) for further information.

A. Identify/describe radioactive items/samples:

N/A

B. Identify/describe hazardous items/samples:

N/A

C. Identify/describe biological items/samples and shipment method:
Include any special handling requirements for TSA/Customs inspections (light sensitive, do not X-ray, etc.).

N/A

How will biological samples be transported away from BNL? ☐ Personal/Ground ☐ Personal/Air ☐ Contract Carrier

11. Research Description:
Provide the information requested below as a separate Word document or PDF and attach to this form. **ANSWER ALL QUESTIONS**.

A. Experimental Proposal: Provide sufficient detail to justify your beam time request. Proposal is limited to three (3) pages maximum and must include the following information (if you submit your grant progress report for section 11.A.4, the three page proposal limit applies to the remaining sections):

1. Title of proposal (identify proposal as new, renewal, or replacement)
2. Project summary/overview
3. Background and significance
4. Progress report (for renewal proposals, you may submit your most recent funding agency grant progress report; for new proposals, include any supporting preliminary results). This report should include progress accomplished in prior runs, problems encountered and lessons learned, any deferrals, and responses to previous SACRR proposal review items.
5. List of three (3) publications (to assist the SACRR in its evaluation of previous work/experience and project feasibility).
6. Description of PI and team's previous accelerator experience (1 paragraph maximum).

B. Beam Time Request: Provide sufficient detail to justify the amount of beam time you are requesting. SACRR must be convinced that previously awarded beam time was efficiently and judiciously used, and that you will require the full amount of time for your current request. You must also justify the requested ion species. For this section, you must include:

1. Detailed experimental plan for all experiments to be conducted. Be sure to include the number and type (T25 flasks, chamber slides, mice, etc.) of samples per entry.
2. Beam time calculations (see Att. 6 Beam Time Calculation Table. Sequential beam requests cannot be completed on this beam time calculation table; please submit separate calculation table, see Notes section of Att. 6 for details). Include the total time requested for all ions and energies in Beam Time Request Summary (located on page 1).
3. Other information that may be helpful in justifying your beam time request to SACRR (optional).