Location: Berkner Hall, Brookhaven National Laboratory, except as noted.

**Tuesday, April 29**

9:00 AM - 5:00 PM  Registration
                 Training for BNL-1 and 2 returnees and new investigators

**Wednesday, April 30**

8:00 - 8:30 AM     Registration

8:30 - 8:35 AM     Introduction and Announcements (B. M. Sutherland)

8:35 - 8:45 AM     Welcome/Opening Remarks (T. Kirk, W. Schimmerling)

**Session I  Radiation and Risk**

Chair: S. B. Curtis  
Co-chair: L. W. Townsend

8:45 - 9:15 AM     The Future of Space Radiation Research (R. Setlow)

9:15 - 10:00 AM    Uncertainty in Risk Estimation (C. Meinhold)

10:00 - 10:30 AM   Risk Extrapolation from Cell and Molecular Biology (R. J. M. Fry)

10:30 - 11:00 AM   Break

11:00 - 11:30 AM   Overview of Solar Particle Events (R. Turner)

11:30 AM - Noon    Fluence-Based, Dose-Based and Event-Based Radiation Protection Systems for Spaceflight - Discussions by NCRP Committee 88 (S. B. Curtis)

Noon - 1:00 PM     Lunch

1:00 - 1:15 PM     Atmospheric Ionizing Radiation Exposures in Commercial High Altitude Aircraft Operations (D. L. Maiden)

1:15 - 1:45 PM     Radiation Safety for High Altitude Aircraft and the Atmospheric Ionizing Radiation Measurement Project (P. Goldhagen)

1:45 - 2:00 PM     The Concept of Acceptable Risk in Life Support Systems for Piloted Space Flight (V. Petrov)
<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>2:00 - 3:30 PM</td>
<td>BNL/AGS Radiobiology Facilities Users’ Meeting</td>
</tr>
<tr>
<td>3:30 - 4:30 PM</td>
<td>Tour of AGS, including radiobiology facilities (M. E. Vazquez, D. Lazarus)</td>
</tr>
<tr>
<td>4:30 - 5:30 PM</td>
<td>Tour of BNL Medical Department laboratory facilities (S. J. Gatley)</td>
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<tr>
<td>7:00 - 9:00 PM</td>
<td>Reception (Ramada Inn East End)</td>
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**Thursday, May 1**

**Session II**  
AGS Experiments - I

**Chair:** T. C. Yang  
**Co-chair:** L. Lutze-Mann

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9:00 - 9:15 AM</td>
<td>AGS Operations (D. Lowenstein, P. Pile, D. Lazarus)</td>
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<tr>
<td>9:15 - 9:30 AM</td>
<td>BNL-2 Run Summary (M. E. Vazquez, L. Heilbronn)</td>
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**BNL-2 Results: Cell and Tissue Radiobiology**

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9:30 - 9:45 AM</td>
<td>Lethal and Cytogenetic Effects of Iron Particles (T. C. Yang, H. Wu, K. George, M. Durante and L. Craise)</td>
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<tr>
<td>9:45 - 10:00 AM</td>
<td>Early Cellular Responses to 1 GeV/amu Iron Ion Exposure (N. F. Metting)</td>
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<tr>
<td>10:00 - 10:15 AM</td>
<td><em>In Vitro</em> Neurotoxicity of 1 GeV/amu $^{56}$Fe Ions (M. E. Vazquez and E. Kirk)</td>
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<tr>
<td>10:15 - 10:30 AM</td>
<td>Some Preliminary Results on the Responses of L5178Y S/S Cells to 1 Gev/amu $^{56}$Fe ions</td>
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<tr>
<td>10:30 - 11:00 AM</td>
<td>Break</td>
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</tbody>
</table>

**BNL-2 Results: Animal Radiobiology**

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11:00 - 11:15 AM</td>
<td>HZE-Induced Remodeling of Tissue Microenvironments (M. H. Barcellos-Hoff, D. Callahan and B. Parvin)</td>
</tr>
<tr>
<td>11:15 - 11:30 AM</td>
<td>The Effect of Exposure to High Energy Iron Ions on Different Endpoints in Transgenic Mice (L. Lutze-Mann, I. P. Samuels, R. A. Winegar, M. J. Ramsey, J. D. Tucker and V. E. Walker)</td>
</tr>
<tr>
<td>11:30 - 11:45 AM</td>
<td>Effects of Exposure to 1 GeV/nucleon $^{56}$Fe Particles on Amphetamine-Induced Taste Aversion Learning (B. M. Rabin, J. A. Joseph, B. Shukitt-Hale and S. Erat)</td>
</tr>
<tr>
<td>11:45 AM - Noon</td>
<td>Oxidative Stress in the CNS and Cosmic Radiation ($^{56}$Fe Particles): Implications for Immediate or Delayed Behavioral Performance Deficits (J. A. Joseph, B. Shukitt-Hale, B. M. Rabin and S. Erat)</td>
</tr>
<tr>
<td>Noon - 12:15 PM</td>
<td>Evaluation of Mitotic Abnormalities and Micronucleated Lens Cells After 1 Gev/amu $^{56}$Fe Irradiation (A. Lindgren, K. Beetham, L. Miranda, J. Edwards and G. Lindgren)</td>
</tr>
</tbody>
</table>
Measurement of Dopamine Receptors and Transporters in Rats After Irradiation with a 1 GeV/amu $^{56}$Fe Beam (S. J. Gatley, M. E. Vazquez, B. Pyatt, A. Lindgren and N. Volkow)

Lunch

Session III  AGS Experiments - II

Chair: M. E. Vazquez
Co-chair: B. M. Rabin

BNL-2 Results:  Physics


1:45 - 2:00 PM  Wall Effects Observed in Tissue-Equivalent Proportional Counters from 1.05 GeV/nucleon $^{56}$Fe Ions (S. E. Rademacher, T. B. Borak, C. Zeitlin, L. Heilbronn, J. Miller and S. A. Baynes)

2:00 - 2:15 PM  Characterization of the 1996 1 GeV/u $^{56}$Fe Beam (C. Zeitlin, L. Heilbronn and J. Miller)

BNL-2 Results:  DNA Damage and Repair

2:15 - 2:30 PM  LET Effects on Repair of Base Damage and Double-Strand Break Rejoining (P. K. Cooper, M. Löbrich, S. A. Leadon and B. Rydberg)

2:30 - 2:45 PM  DNA Double Strand Break Quantitation in Human Cells Irradiated with cGy Doses of Fe (1Gev/amu) Ions (B. M. Sutherland, P. V. Bennett and J. C. Sutherland)

2:45 - 3:00 PM  Track Structure Theory Applied to DNA Strand Breaks Produced in Mammalian Cells (T. Jorgensen, P. Russell and L. Thomas)


3:15 - 3:45 PM  Break

BNL-2 Results:  Mutagenesis

3:45 - 4:00 PM  Effect of p53 on Cell Killing and Mutation Induction Following Low Fluence Exposure to 1090 MeV/amu Fe Ions (A. Kronenberg, S. Gauny, C. Cherbonnel-Lasserre, W. Liu and C. Wiese)


4:30 - 4:45 PM Molecular Analysis of Heavy Ion-Induced Genomic Alterations in Human Mammary Epithelial Cells (S. Yamada, T. C. Yang, K. George and P. K. Riggs)

4:45 - 5:30 PM Panel Discussion: BNL-3 and Beyond - Scientific Objectives (Barcellos-Hoff, Cox, Cucinotta, Evans, Lutze-Mann, Nelson, Yang)
Chair: A. Kronenberg
Co-chair: B. M. Sutherland

7:00 - 9:00 PM Dinner (Brookhaven Center)

Friday, May 2

Session IV
Chair: S. J. Gatley
Co-chair: L. Heilbronn

9:00 - 9:45 AM LBL-CSU NSCORT Summary (A. Chatterjee)

9:45 - 10:30 AM Imaging the Human Brain with Positron Emission Tomography (N. Volkow, J. Fowler and S. J. Gatley)

10:30 - 11:00 AM Break

11:00 - 11:15 AM The National Space Biomedical Research Institute (NSBRI): Radiation Effects (J. Dicello)

11:15 AM - Noon LLUPTC Facilities Update (G. A. Nelson, M. Moyers)

Noon - 1:00 PM Lunch

Session V International Research
Chair: J. Kiefer
Co-chair: V. Petrov

1:00 - 1:20 PM Mutation Induction in Mammalian Cells by Heavy Ions: Cross Sections and Mutational Spectra (J. Kiefer and P. Schmidt)


1:35 - 1:50 PM LET-RBE and -OER Spectra of Cell Killing for Accelerated $^3$He, $^{12}$C, $^{20}$Ne, $^{40}$Ar and $^{56}$Fe Ion Beams upon V79 Cells (Y. Furusawa, K. Fukutsu, M. Saito, F. Yatagai and T. Kanai)


2:05 - 2:30 PM Radiobiology Experiments Using Low Energy Ions at the INFN-Laboratori Nazionali de Legnaro (R. Cherubini)
Session VI  Physics - Experiments and Models

Chair:  J. Miller
Co-chair:  J. W. Wilson

2:30 - 2:45 PM  Depth Dependence of Absorbed Dose, Dose Equivalent, and Linear Energy Transfer Spectra in Polyethylene and Comparison with Model Calculations (G. D. Badhwar and F. A. Cucinotta)

2:45 - 3:00 PM  Fragmentation of 275 MeV/u $^{12}\text{C}$ in C, CH$_2$, Al, Cu and Pb (J. Miller, A. Fukumura, L. Heilbronn, T. Murakami and C. Zeitlin)

3:00 - 3:30 PM  Break


3:45 - 4:00 PM  Calculation of the Microdosimetric Quantity, Mean Specific Energy Squared, $Z_{eq}$, as a Function of Radial Distance from Heavy Ions (R. Katz, F. A. Cucinotta and J. W. Wilson)

4:00 - 4:15 PM  Molecular Kinetics Description of the Cell Cycle and Gene Expression After X-ray and Heavy Ion Exposure (F. A. Cucinotta, J. W. Wilson, J. F. Dicello, J. R. Williams and M. Mabry)

4:15 - 4:30 PM  Biophysical Modeling of Radiation-Induced Large Deletion Mutations in the Human HPRT Gene (H. Wu, R. K. Sachs and T. C. Yang)

Session VII  Flight Measurements

Chair:  G. Reitz
Co-chair:  G. D. Badhwar

4:30 - 4:45 PM  Radiation Measurements and Radiobiological Experiments in Space (G. Reitz, C. Baumstark-Khan, R. Beaujean, R. Facius, G. Horneck and P. Rettberg)

4:45 - 5:00 PM  Preliminary Results from the Environmental Radiation Measurements Experiment Aboard the Mir Station (E. R. Benton, E. V. Benton and A. L. Frank)

5:00 - 5:15 PM  Solar Modulation of Dose Rate On Board the Mir Station (G. D. Badhwar, V. Shurshakov and V. Tsetlin)


7:00 - 10:00 PM  Banquet
Speaker:  Dr. Christopher S. Romanek
Savannah River Ecology Laboratory
University of Georgia
Title:  Potential Biologic Origin for Secondary Minerals in Martian Meteorite ALH84001
Saturday, May 3

Session VIII  Animal, Tissue and Cell Radiobiology
Chair: M. H. Barcellos-Hoff
Co-chair: A. B. Cox

9:00 - 9:20 AM  Modeling Human Risk: Cell and Molecular Biology in Context (H. Warner, M. J. Bissell and A. Chatterjee)


9:35 - 9:50 AM  Radiation Effects on the Balance Between Cell Growth, Differentiation and Death in Human Lens Epithelial Cells (E. Blakely, K. Bjornstad, P. Chang, G. Aragon and S. Lin)

9:50 - 10:05 AM Radiation Exposure Decreases Electrical Resistance Across Cell Membranes in Cultured Epithelial Cells (P. K. Riggs, C. H. Pedemonte and T. C. Yang)


10:35 - 10:50 AM Break

Session IX  Molecular Radiobiology
Chair: E. Blakely
Co-chair: N. F. Metting


11:05 - 11:20 AM Relationship of DNA Double Strand Break Induction and Repair to the Spectrum and Frequency of Mutation in the Human-Hamster Hybrid AL (B. Fouladi, C. Waldren and P. K. Cooper)

11:20 - 11:35 AM Assessment of Radiation-Induced Carcinogenesis by Molecular Biomarkers: Oncogene Activation and Altered Tumor Suppressor Expression (A. C. Miller, J. Xu, T. Whittaker and E. J. Ainsworth)

11:35 - 11:50 AM Radiation Anticarcinogenesis by Thiazolidine Prodrugs (R. Warters and J. Roberts)

11:50 AM - Noon Closing Remarks (W. Schimmerling)

Noon Adjourn