

FINAL PROGRAM

SEVENTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS

To be held July 15-16, 2009; University of Maine, Orono,
Maine, USA

This symposium continues the tradition set by the first symposium in this series: "Silanes and Other Coupling Agents" which was hosted in 1991 by the Dow Corning Corporation in honor of Dr. Edwin P. Plueddemann. As with its predecessors, this symposium is concerned with the technological areas where the use of surface primers such as silanes is critical to the success of many technologies.

We are indeed happy to announce that this the 7th symposium in the series is organized in collaboration with Prof. Douglas Gardner in the Advanced Engineered Wood Composites Center at the University of Maine, Orono, Maine. Prof. Gardner is well acquainted with problems of adhesion and coupling agents as applied to wood composites and is also serving on the editorial board of the Journal of Adhesion Science and Technology for which the Conference Director Dr. Mittal is Editor-in-Chief. Prof. Gardner and his group look forward to hosting this symposium and greeting all participants from both academia and industry from all corners of the globe.

Historically the silanes have been used as coupling agents for thin films in the microelectronics industry and in glass fiber composites where the use of silanes has been an enabling factor in the success of many manufactured products. Quite surprisingly, silanes have also found a role in biotechnology as specific coupling agents for bonding polynucleotides to the so-called "gene chips" and also in cosmetic applications. This symposium is organized to bring together scientists, technologists and engineers interested in all aspects of coupling agent technology, to review and assess the current state of knowledge, to provide a forum for exchange and cross-fertilization of ideas and to define problem areas which need intensified efforts. The invited speakers have been selected so as to represent widely differing disciplines and interests, and they hail from academic, governmental and industrial research laboratories. This meeting is planned to be a truly international event with participation from research groups from academia and industry worldwide.

Finally, all presenting authors are invited to submit their manuscripts for publication in the Journal of Adhesion Science and Technology.

SESSION I: WEDNESDAY, JULY 15, 2009 (JOINT SESSION WITH POLYMER SURFACE MODIFICATION SYMPOSIUM)

8:00-8:30: F.J. Xu, S.J. Yuan, G. L. Li, K.G. Neoh and **E.T. Kang**; Dept. of Chemical and Biomolecular Engineering, National University of Singapore, Kent Ridge, SINGAPORE 119260; **Surface Functionalization via Controlled Radical Polymerizations**

8:30-9:00: **Thomas Bahners** and Eckhard Schollmeyer; Deutsches Textilforschungszentrum Nord-West e. V., Adlerstr. 1, D-47798 Krefeld, GERMANY; **Photo-initiated Inter-Linking of Coatings on Textiles and Other Polymer Substrates**

9:00-9:30: S.A. Pihan, T. Tsukruk, A. Chifen and **R. Förch**; Max-Planck-Institut für Polymerforschung, Ackermannweg 10, D-55128 Mainz, GERMANY; **Plasma Polymerized Hexamethyl Disiloxane in Adhesion Applications**

9:30-10:00: **Karina Grundke**, Jan Roth, Victoria Albrecht, Mirko Nitschke, Cornelia Bellmann, Frank Simon, Stefan Zschoche, Stefan Michel, Claudia Luhmann and Brigitte Voit; Leibniz Institute of Polymer Research Dresden, P. O. Box 120 411, D-01005 Dresden, GERMANY; **Surface Functionalization of Silicone Elastomers to Form Permanently Stable Adhesion Joints**

10:00-10:15: COFFEE BREAK

10:15-10:45: **Denis Dowling**; University College Dublin, Room 223 Engineering Building, UCD, Belfield, Dublin 4, IRELAND; **Influence of Processing Conditions on the Adhesion Performance of Atmospheric Plasma Polymerized Primer Coatings on Steel**

10:45-11:15: N. A. Darwish, A. A. El-Wakil and **A. I. Abou-Kandil**; National Institute of Standards, Tersa Street. El-Haram. El-Giza.P.O.Box: 136 Giza. Post Code: 12211, EGYPT; **Graft Co-Polymerization of 1, 5 Diaminonaphthalene to Improve Adhesion Between EPDM Rubber and Polyester Fabric**

11:15-11:45: Gijo Raj, Eric Balnois, Christophe Baley and **Yves Grohens**; Laboratoire d'Ingénierie des MATériaux de Bretagne (LIMATB), Université de Bretagne Sud, Rue de Saint Maudé, BP 92116, F-56321 Lorient Cedex, FRANCE; **Interfaces in Biocomposites: Colloid Force Measurements Between Cellulose and Poly(lactic Acid)**

11:45-12:15: Sang Wook Park and **Dai Gil Lee**; Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, ME3221, Guseong-dong, Yuseong-gu, Daejeon 305-701, REPUBLIC OF KOREA; **Adhesion Characteristics of Surface-treated Glass/Epoxy Composite with Nano-particles**

12:15-1:30: LUNCH

SESSION II: WEDNESDAY, JULY 15, 2009 (JOINT SESSION WITH POLYMER SURFACE MODIFICATION SYMPOSIUM)

1:30-2:00: **F. Griffon**, C. Delval and P. Hoffmann; EPFL, Station 17, Lausanne VD 1015, SWITZERLAND; **Hot-Embossing: a Novel Technique for the Replication of Superhydrophobic Polymer Samples**

2:00-2:30: **Arthur J. Coury**; Warren Avenue, Boston, Massachusetts 02116; **Exploiting Biomaterial-Tissue Interactions for Effective Medical Device Performance**

2:30-3:00: Z. L. Shi, F. Zhang, E. T. Kang and **K. G. Neoh**; Department of Chemical and Biomolecular Engineering, National University of Singapore, Kent Ridge, Singapore 119260, SINGAPORE; **Exploiting Natural Biopolymers for Selective Bio-interactivity with Bacteria and Bone Cells in Orthopedic Applications**

3:00-3:30: **K. Schröder**, B. Finke, F. Lüthen, J. B. Nebe, J. Rychly, U. Walschus, M. Schlosser, A. Ohl and K. D. Weltmann; Leibniz Institute for Plasma Science and Technology (INP), F.-Hausdorff Straße 2, D-17489 Greifswald, GERMANY; **Plasma Polymer Coatings for Improved Cell Adhesion to Titanium Surfaces**

3:30-3:45: COFFEE BREAK

3:45-4:15: **José M. Kenny**, Ilaria Armentano and Serena Dotori; European Centre for Nanostructured Polymers, University of Perugia, Loc. Pentima Bassa 21, 05100 Terni, ITALY; **Plasma Modification and Surface Functionalization of Biodegradable Polymers for Controlling the Adhesion of Stromal Cells**

4:15-4:45: **Sean X. Liu**; Cereal Products and Food Science Research Unit, National Center for Agricultural Utilization Research, U.S. Department of Agriculture, ARS, 1815 N. University Street, Peoria, IL 61604; **The Effect of Polymer Surface Modification on Polymer-Protein Interaction via Interfacial Polymerization and Hydrophilic Polymer Grafting**

4:45-5:15: **Charles Anamelechi**; Biomedical Engineering Department, Duke University (CIEMAS 1313), 144 Hudson Hall, Durham, NC 27708; **Endothelial Cell Adhesion to Synthetic Vascular Grafts Using Biotinylated Fibronectin in a Dual Ligand Protein System**

5:15-5:45: **M-L. Abel**, J. Bertho, P. Zdhan, V. Stolojan and J. F. Watts; The Surface Analysis Laboratory, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford Surrey GU2 7XH, UK; **Effect of Incorporation of Silanes within Epoxy Adhesives on Interface Chemistry: a Surface Analysis Study**

5:45-6:15: **M. Masudul Hassan**, Marco Mueller and Manfred H. Wagner; Technical University of Berlin, Institute of Material Science and Technology, Polymertechnik/Polymerphysik, Fasanen Str. 90, D-10623, Berlin, GERMANY; **Improvement of Mechanical Performance of Hybrid Seaweed/Rice Straw Polypropylene Composite: Effect of Maleic Anhydride**

6:15-6:45: **N. Kasálková**, Z. Makajová, K. Količková, P. Slepíčka, L. Bačková, M. Pačzek and V. Švorček; Department of Solid State Engineering, Institute of Chemical Technology, 166 28 Prague, CZECH REPUBLIC; **Cytocompatibility of Plasma-treated and Grafted Polyethylene**

SESSION III: THURSDAY, JULY 16, 2009

8:00-8:05: INTRODUCTORY REMARKS

8:05-8:35: **Barry Arkles**, Youlin Pan and Eric Eisenbraun; Gelest, Inc., 11 East Steel Road, Morrisville, PA 19067; **Chemical Bonding to Metals: Hydridosilanes as Coupling Agents**

8:35-9:05: **Philipp Bringmann**, Franz Gammel and Irene Jansen; EADS Innovation Works, Munich, GERMANY; **Comparison of Atmospheric Plasma and Wet-chemical Derived Coupling Films as Pretreatment for Structural Bonding**

9:05-9:35: **Claudius D'Silva** and Catalin Fotea; School of Biology, Chemistry & Health Sciences, Manchester Metropolitan University, John Dalton Building, Chester Street, Manchester M1 5GD, UK; **Adhesion Enhancement via the Use of Silane Reagents**

9:35-10:05: Jukka Matinlinna, Pekka VALLITTU and Lippo LASSILA; University of Hong Kong, Dental Materials Science, Faculty of Dentistry, Hong Kong SAR, P.R. CHINA; **Effects of Different Silane Coupling Agents on Flexural Strength of an Experimental Filled Resin Composite**

10:05-10:20: COFFEE BREAK

10:20-10:50: Renee Goreham and Janis Matisons; Nanomaterials Group, Flinders University, SOUTH AUSTRALIA; **Kinetics and Properties of New Silane Based Anti-Corrosion Coatings**

10:50-11:20: Anthony A. Parker, Calen Bruce and David Mariasy; A. A. Parker Consulting & Product Development, Newtown, PA; **Improving Musical Instrument String Longevity with Organosilanes**

11:20-11:50: Carl Tripp; Laboratory for Surface Science & Technology, Engineering and Science Research Building, University of Maine, Orono, ME 04469; **Use of Silanes to Design Materials for Detection of Chemicals and Biological Agents**

11:50-12:20: He Huang; Department of Polymeric Materials & Engineering, Wuhan University of Technology, 122 Luoshi Road, Wuhan 430070, CHINA; **Incorporation of Nano SiO₂ Particles on PMMA Using AMP as Coupling Agent via One-stage Miniemulsion Polymerization**

12:20-1:30: LUNCH

SESSION IV: THURSDAY, JULY 16, 2009

1:30-2:00: Peng Wang; Chemical and Materials Engineering, University of Cincinnati, Cincinnati, OH 45221-0012; **Specular Neutron Reflectivity of Silane-laced Epoxy Films**

2:00-2:30: Bhanu P. S. Chauhan; Department of Chemistry, William Paterson University, Wayne, NJ 07470; **Catalytic Polysilylation: An Efficient Approach to Hybrid Materials**

2:30-3:00: Mutlu Özcan; University of Groningen, Department of Dentistry and Dental Hygiene Clinical Dental Biomaterials, Antonius Deusinglaan 1, 9713 AV Groningen, THE NETHERLANDS; **Surface Conditioning Concepts in Adhesive Dentistry: from Theory to Practice**

3:00-3:30: D. P. Dowling, C. Nwankire and M. Ardhaoui; School of Electrical, Electronic and Mechanical Engineering, UCD, Belfield, Dublin 4, IRELAND; **Influence of Precursor Chemistry on the Adhesion of Atmospheric Plasma Deposited Siloxane Coatings onto Stainless Steel**

3:30-3:45: COFFEE BREAK

3:45-4:15: M. Tiwari, W. K. Dierkes, R. N. Datta, A. G. Talma, J. W. M. Noordermeer and Wim J. Van Ooij; Department of Elastomer Technology and Engineering, University of Twente, 7500 AE Enschede, THE NETHERLANDS; **Tailoring Silica Surface Properties by Plasma Polymerization for Elastomer Applications**

4:15-4:45: Garrett Matthews; Department of Physics, University of South Florida, Tampa, FL 33620; **Functionalization of Surfaces with Glycosaminoglycans and Proteoglycans for Investigations of Cell Adhesion**

4:45-5:15: Jin Gyu Kim, Sang Wook Park, Soon Ho Yoon and Dai Gil Lee; KAIST, Mechanical Eng., 335 Gwahangno, Yuseong-gu, Daejeon 305-701, KOREA; **Optimum Silane Treatment of Adhesively Bonded Aluminum Joints at Cryogenic Temperatures**

5:15-5:45: Azhar Ahmad; Malaysian Rubber Board; **Reactive Blending of Poly(ethylene terephthalate) with Functionalized Ethylene Propylene Rubber**

This symposium is being organized by MST Conferences under the direction of Dr. K. L. Mittal, Editor, Journal of Adhesion Science and Technology (JAST) and in collaboration with Prof. Douglas Gardner of the University of Maine, Orono. It is planned to publish the proceedings of this symposium in the Journal of Adhesion Science and Technology, edited by the conference chairman Dr. Mittal. Please notify the conference chairman of your intentions to present a paper as early as possible. An abstract of about 200 words should be sent by **March 15, 2009** to the conference chairman by any of the following methods:

E-mail: rhl@mstconf.com

FAX: 212-656-1016

Regular mail:

Dr. Robert H. Lacombe
Conference Chairman
3 Hammer Drive
Hopewell Junction, NY 12533

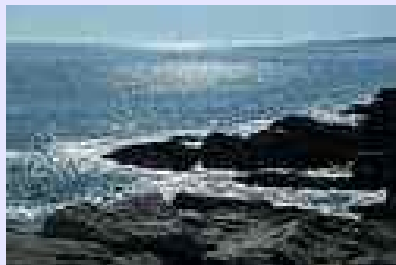
Contact by phone: 845-897-1654; 845-227-7026

Full conference details and registration via the Internet will be maintained on our web site:

<http://mstconf.com/silane7.htm>

Or mail response form below to the conference chairman at the address above.

We invite all symposium participants to join us at the University of Maine this Summer and, if you have a little extra time, you should also try to enjoy the countryside and seashore of the state of Maine which has long been regarded as a Summer vacationland in the US. On the Maine Coast, you'll find elegant Country Inns and Bed and Breakfasts, luxury resorts, family motels, and fabulous full service campgrounds. Discover Maine Vacations that cater to every taste. Maine is considered to be a vacation land by many in the continental US and the month of July is close to the height of the season with a number of pleasant attractions including the Acadia National seashore pictured below:



REGISTRATION INFORMATION

DATES:

JULY 12-15, 2009: SEVENTH INTERNATIONAL SYMPOSIUM ON POLYMER SURFACE MODIFICATION: RELEVANCE TO ADHESION

JULY 15-18, 2009: SEVENTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS

LOCATION:

University of Maine, Orono, Maine

<http://www.umaine.edu/>

HOTEL TRAVEL

These area hotels are offering special conference room rates for the nights of July 10 – 19, 2009 on a first come first serve basis.

Additional nights may be available. Continental breakfast and wireless access are included at each hotel. Rooms in July go fast. Call now to book your room.

To receive these rates, you must mention the MST Conference.

University Inn Academic Suites

5 College Ave, Orono, ME 04473

Tel: (207) 866-4921
Toll-free: (800)321-4921
Fax: (207) 866-4550

\$95.00 per night/single occupants
\$105.00 per night/2 occupants

(Be sure to mention the code MST09 to get the conference rate)

<http://universitymotorinn.com/>

Best Western Black Bear Inn

3 Godfrey Blvd. 04473

Tel: (207) 866-7120

\$109.95 per night
\$5.00 per night/each additional person

<http://www.blackbearinnoronono.com>

The following are hotels that offer free shuttles to and from the airport.

Bangor Motor Inn	(207) 947-0355
Comfort Inn	(207) 942-7899
Days Inn	(207) 942-8272
Econo Lodge	(207) 945-0111
Hampton Inn	(207) 990-4400
Holiday Inn - Odlin Rd.	(207) 947-0101
Ramada Inn	(207) 947-6961
Super 8 Motel – Bangor	(207) 945-5681

AIRPORT AND TRAVEL:

Please see the comprehensive listing on the website:

<Http://www.flybangor.com/>

Taxis are available at the exit doors on a 24 hour basis.

REGISTRATION:

Speaker/student \$395 each; regular attendee \$595 each. A 20% discount applies if you are attending both symposia. An additional 10% discount applies if more than 1 person are participating from the same organization.

ON CAMPUS HOUSING

Housing on campus is also available at a location conveniently nearby the conference meeting room. Full details on reserving accommodations are given in the form at the end of this document. Registrants are asked to fill in the form and FAX it to the number listed on the form. Questions should be directed to Debra Wright at the University of Maine. Her telephone number and E-mail address are listed at the bottom of the form. Online details are available at:

www.umaine.edu/conferences

TO REGISTER FOR SYMPOSIUM:

BY PHONE: 845-897-1654; 845-227-7026

BY FAX: 212-656-1016

E-mail: rhl@mstconf.com

REGISTER ONLINE:

www.mstconf.com/mstreg.htm

BY MAIL:

SEND COMPLETED FORM BELOW TO:

Dr. Robert Lacombe
Chairman
MST Conferences
3 Hammer Drive
Hopewell Junction, NY 12533-6124, USA

SHORT COURSE ON APPLIED ADHESION MEASUREMENT METHODS

JULY 10 and 19, 2008: Associated with these symposia MST gives a short course on adhesion measurement methods. Since nearly all of the MST symposia have some relation to adhesion phenomena, the ability to quantify the adhesion of one material layer to another is clearly one of the unifying themes. This course is designed to mesh with the topical symposia by presenting an overview of the most useful adhesion measurement techniques which are being used to evaluate the **PRACTICAL ADHESION** of coatings. Emphasis will be given to methods which can be carried out in a manufacturing environment as well as in the lab and which give results that are directly relevant to the durability and performance of the coatings. The effects of material elastic properties and residual stress are considered as well as other external influences which affect coating adhesion.

How You Will Benefit From This Course:

- ▶ Understand advantages and disadvantages of a range of adhesion measurement techniques.
- ▶ Gain insight into mechanics of adhesion testing and the role of intrinsic stress and material properties
- ▶ Learn optimal methods for setting adhesion strength requirements for coating applications.
- ▶ Learn how to select the best measurement technique for a given application.
- ▶ Gain perspective from detailed discussion of actual case studies of product manufacturing and development problems.

A complete syllabus of the short course is available at:

www.mstconf.com/AdhesionShortCourse.pdf

SHORT COURSE ON DURABILITY OF ADHESIVE JOINTS AND COMPOSITES

JULY 11, 2009: When you make an adhesive joint or a composite as part of some device or product there is always the concern of the durability of the joint bond or the strength of the filler/matrix adhesion. Whether the product is something as prosaic as a cereal box or

as high tech as a jet aircraft, the consequences of failure can range anywhere from an annoying nuisance to the endangerment of lives. Thus this course will give an overview of the technology and tools available for evaluating beforehand the expected performance of adhesive joints and composites subjected to the environmental and load conditions under which they must survive.

How You Will Benefit from this Course:

Understand advantages and disadvantages of a range of test methods for adhesive joints and composites

Gain insight into mechanics of adhesion testing and the role of material properties

Explore the full range of phenomena affecting composite and joint reliability including: adhesion to substrate, thermal-mechanical properties of adhesive and matrix binder materials and the effect of residual stress.

Review most important non-destructive inspection methods for discovering flaws in joint formation and composite structure

Gain perspective from detailed discussion of actual case studies of product manufacturing and development problems

A complete syllabus of the short course is available at:

www.mstconf.com/JointDurabilityV2.pdf

Audience: Both of the above short courses are tailored to meet the needs of scientists and professional staff in R&D, manufacturing, processing, quality control/reliability involved with adhesion aspects of coatings, laminate structures, composite materials or adhesive joining processes.

Level: Beginner to Intermediate

Prerequisites: Elementary background In chemistry, physics or materials science.

Duration: 1 day

Registration fee: \$595: Includes course notes, handouts and a copy of the newly published handbook and reference volume: **ADHESION MEASUREMENT METHODS: THEORY AND PRACTICE** (CRC Press, 2006).

CANCELLATIONS: Registration fees are refundable, subject to a 15% service charge, if cancellation is made by **June 20, 2009**. **NO** refunds will be given after that date. All cancellations must be in writing. Substitutions from the same organization may be made at any time without penalty. MST Conferences reserves the right to cancel any of the symposia or the short course if it deems this necessary and will, in such event, make a full refund of the registration fee. No liability is assumed by MST Conferences for changes in program content.

REGISTRATION FORM: CHECK ALL THAT YOU WANT TO ATTEND

SEVENTH INTERNATIONAL SYMPOSIUM ON POLYMER SURFACE MODIFICATION, JULY 12-15, 2009 (speaker/student)	\$395
SEVENTH INTERNATIONAL SYMPOSIUM ON POLYMER SURFACE MODIFICATION, JULY 12-15, 2009 (regular attendee)	\$595
SEVENTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS, JULY 15-18, 2009 (speaker/student)	\$395
SEVENTH INTERNATIONAL SYMPOSIUM ON SILANES AND OTHER COUPLING AGENTS, JULY 15-18, 2009, (regular attendee)	\$595
Sub Total	
Deduct 20% if attending both Symposia. Deduct additional 10% if more than 1 participant from same institution	
Short Course on Applied Adhesion Measurement Methods, Select Date: <input type="checkbox"/> July 10; <input type="checkbox"/> July 19	\$595
Short Course on Durability of Adhesive Joints and Composites, <input type="checkbox"/> July 11	\$595
TOTAL REGISTRATION FEE	

METHOD OF PAYMENT, CHECK WHICH METHOD YOU PREFER

CREDIT CARD: Check here and fill out box below	
BANK WIRE TRANSFER: Check here and contact the symposium Chairman, Dr. Lacombe for bankwire information either by phone, FAX or E-mail: Tel. 845-897-1654 FAX: 212-656-1016 E-mail: rhlacombe@compuserve.com	
CHECK: Make check payable to MST Conferences, LLC and mail to: Dr. Robert H. Lacombe Conference Chairman 3 Hammer Drive Hopewell Junction, NY 12533-6124, USA	

CREDIT CARD INFORMATION

- VISA
- MASTER CARD
- AMERICAN EXPRESS
- DINERS CLUB

Expiration Date: _____

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ADDRESS:	
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PHONE:	FAX:

Card Number: _____ Card Holder Name: _____
(As it appears on card)

MST Conference July 9 - 19, 2009

Housing Registration Form . Deadline for form return – Friday, June 16, 2009

Cancellation policy: Through July 1, full payment will be refunded less the \$15 processing fee.

PLEASE CHECK ONE: Male: _____ Female: _____

Name: _____ Day phone _____

Mailing address: _____

Evening phone _____ Fax # _____

E-mail address _____

Lodging on campus will be available on the nights of July 9, 2009 through July 19, 2009

Check in date: _____	Check out date: _____	
Single room ~ twin bed	\$60.50 per night for ____ nights	_____
Double room ~ twin beds	\$40.65 <u>per person</u> per night for ____ nights	_____
Processing fee	\$15.00	_____ 15.00
TOTAL REMITTED		_____

Payment Information

Charge to: ____ Visa ____ MasterCard

Important: Please submit card information by fax only (207) 581-4097, not via email.

Card Number: _____

Signature: _____ Expiration Date: _____

Lodging will be at Edith Patch Hall in suites with a living area and kitchen facilities (refrigerator, stove, but no coffee maker, cooking vessels, china, or utensils). Suites have between 2 and 4 bedrooms. In suites with two bedrooms, the bedrooms are doubles. In suites with three bedrooms, there are two singles and one double. In suites with four bedrooms, there are four singles. Thus, you may list up to 4 suite mates (being sure that those you list also list you!). If you don't list suite mates, those bedrooms may be assigned to others in your program.

- 1 3
- 2 4

Please use a separate form with payment for each individual

Special needs: Please tell us about any special needs, such as access to accommodations:

Please fax or mail completed housing form and payment to:

University of Maine
Conference Services Division – MST Conference
5713 Chadbourne Hall
Orono, ME 04469-5713

Tel (207) 581-4094, Fax: (207) 581-4097

Questions about housing at the University of Maine: Debra Wright at tel (207) 581-4094

Email: Debra.Wright@umit.maine.edu

Meting space details of residence halls can be viewed at:
www.umaine.edu/conferences/meetingspacegallery/meetingspace.htm