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**2002 GORDON RESEARCH CONFERENCE
on WATER & AQUEOUS SOLUTIONS
FINAL PROGRESS REPORT**

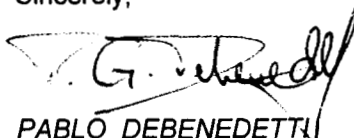
DEPARTMENT OF ENERGY
GRANT NO. DE-FG02-02ER15310

The Gordon Research Conference (GRC) on WATER & AQUEOUS SOLUTIONS was held at Holderness School from 8/4/02 thru 8/9/02. The Conference was well-attended with 123 participants (attendees list attached). The attendees represented the spectrum of endeavor in this field coming from academia, industry, and government laboratories, both U.S. and foreign scientists, senior researchers, young investigators, and students.

In designing the formal speakers program, emphasis was placed on current unpublished research and discussion of the future target areas in this field. There was a conscious effort to stimulate lively discussion about the key issues in the field today. Time for formal presentations was limited in the interest of group discussions. In order that more scientists could communicate their most recent results, poster presentation time was scheduled. Attached is a copy of the formal schedule and speaker program and the poster program. In addition to these formal interactions, "free time" was scheduled to allow informal discussions. Such discussions are fostering new collaborations and joint efforts in the field.

I want to personally thank you for your support of this Conference. As you know, in the interest of promoting the presentation of unpublished and frontier-breaking research, Gordon Research Conferences does not permit publication of meeting proceedings. If you wish any further details, please feel free to contact me. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "P. Debenedetti", written over a horizontal line.

PABLO DEBENEDETTI
PRINCETON UNIVERSITY

WATER & AQUEOUS SOLUTIONS

August 4-9, 2002
Holderness School
Plymouth, NH

Chairs: **Pablo Debenedetti & John Finney**
Vice-Chairs: **Alfons Geiger & Richard Saykally**

SUNDAY

2:00 pm - 9:00 pm Arrival and check-in

5:00 pm - 6:00 pm Chair's reception

6:00 pm Dinner

7:30 pm - 9:30 pm **WET EARTH - HOW OUR PLANET WORKS**

[[click here for detailed session information](#)]

Discussion Leader: **Alan Thompson** (ETH-Zürich, Switzerland)

7:30 pm - 7:40 pm **Alan Thompson** (ETH-Zürich, Switzerland)
Introductory remarks

7:40 pm - 8:35 pm **Greg Hirth** (Woods Hole Oceanographic Institute, USA)
"Why water is required for the unique plate-like behavior of the Earth"

8:35 pm - 9:30 pm **Craig Manning** (University of California, Los Angeles, USA)
"In deep water: dense aqueous solutions and their role in Earth's evolution"

MONDAY

7:45 am - 8:45 am Breakfast

8:45 am Conference photo

9:00 am - 12:30 am **WATER IN AEROSOLS AND CLOUDS**

[[click here for detailed session information](#)]

Discussion Leader: **Thomas Peter** (ETH-Zürich, Switzerland)

9:00 am - 9:15 am **Thomas Peter** (ETH-Zürich, Switzerland)
Introductory remarks

9:15 am - 10:10 am **Marcia Baker** (University of Washington, Seattle, USA)
"The roles of water in cloud radiative and electrical phenomena"

10:10 am - 10:40 am Coffee break

10:40 am - 11:35 am **Thomas Koop** (ETH-Zürich, Switzerland)
"Metastable aqueous solutions in atmospheric aerosol droplets"

11:35 am - 12:30 pm **Maria Cristina Facchini** (Inst. Atmosph. & Climate Sci., Italy)
"Chemical effects on cloud activation with special emphasis on the effect of organic compounds"

12:30 pm Lunch

4:00 pm - 6:00 pm Poster session

6:00 pm Dinner

7:30 pm - 9:30 pm **AMORPHOUS, SUPERCOOLED AND GLASSY WATER**

[[click here for detailed session information](#)]

Discussion Leader: **Erwin Mayer** (University of Innsbruck, Austria)

7:30 pm - 7:40 pm **Erwin Mayer** (University of Innsbruck, Austria)
Introductory remarks

7:40 pm - 8:35 pm **Alan Soper** (Rutherford Laboratory, Chilton, UK)

- 8:35 pm - 9:30 pm **C. Austen Angell** (Arizona State University, Tempe, USA)
 "The structure of the low temperature forms of water as seen by neutron diffraction"
 "Exploring water in "No-Man's Land" by parallel annealing studies of hyperquenched samples of water and solutions"

TUESDAY

7:45 am - 8:45 am Breakfast

9:00 am - 12:30 am **AQUEOUS SOLUTIONS**

[[click here for detailed session information](#)]

Discussion Leader: **Ed Castner** (Rutgers University, USA)

9:00 am - 9:15 am **Ed Castner** (Rutgers University, USA)
 Introductory remarks

9:15 am - 10:10 am **Daniel Bowron** (Rutherford Laboratory, Chilton, UK)
 "Ion-amphiphile interactions in aqueous solution"

10:10 am - 10:40 am Coffee break

10:40 am - 11:35 am **Kenneth Harris** (Australian Defence Force Academy, Australia)
 "Molecular motion and solution structure: high pressure diffusion studies of water and aqueous solutions of amphiphilic solutes"

11:35 am - 12:30 pm **Giulia Galli** (Lawrence Livermore National Laboratory, USA)
 "Ab-initio simulations of water under pressure and of simple aqueous solutions"

12:30 pm Lunch

4:00 pm - 6:00 pm Poster session

6:00 pm Dinner

7:30 pm - 9:30 pm **BIOPRESERVATION AND PHYSICAL CHEMISTRY IN LOW-MOISTURE FORMULATIONS**

[[click here for detailed session information](#)]

Discussion Leader: **Christopher Roberts** (Pfizer, Groton, USA)

7:30 pm - 7:40 pm **Christopher Roberts** (Pfizer, Groton, USA)
 Introductory remarks

7:40 pm - 8:20 pm **George Zografi** (University of Wisconsin, Madison, USA)
 "Factors influencing water vapor absorption by amorphous solids at various relative humidities"

8:20 pm - 8:55 pm **Michael Pikal** (University of Connecticut, Storrs, USA)
 "The effect of water on the physical and chemical properties of proteins in the solid state: protein structure, dynamics, and pharmaceutical stability"

8:55 pm - 9:30 pm **Juan dePablo** (University of Wisconsin, Madison, USA)
 "Cryoprotectants and lyoprotectants in solution. Structure, properties, and their relation to biopreservation efficacy"

WEDNESDAY

7:45 am - 8:45 am Breakfast

9:00 am - 12:30 am **SELF-ASSEMBLY IN WATER**

[[click here for detailed session information](#)]

Discussion Leader: **Adrian Parsegian** (National Institutes of Health, USA)

9:00 am - 9:15 am **Adrian Parsegian** (National Institutes of Health, USA)
 Introductory remarks

9:15 am - 10:10 am **Robert Prud'homme** (Princeton University, USA)
 "Polysaccharide association in aqueous solution"

10:10 am - 10:40 am Coffee break

10:40 am - 11:35 am **Sergey Leikin** (National Institutes of Health, USA)
 "How nature uses the properties of water to organize the protein matrix of skin and bone"

11:35 am - 12:30 pm **John Nagle** (Carnegie-Mellon University, Pittsburgh, USA)
 "Structure and interactions in fully hydrated lipid bilayers determined using new diffuse x-ray diffraction methods"

12:30 pm Lunch
 4:00 pm - 6:00 pm Poster session
 6:00 pm Dinner
 7:30 pm - 9:30 pm

STRUCTURE AND DISSOCIATION DYNAMICS IN TETRAHEDRAL LIQUIDS

[[click here for detailed session information](#)]

Discussion Leader: **Frank Stillinger** (Princeton University, USA)

7:30 pm - 7:40 pm **Frank Stillinger** (Princeton University, USA)
 Introductory remarks

7:40 pm - 8:35 pm **Francesco Sciortino** (University of Rome, Italy)
 "Potential energy landscape in water and silica. Basins and saddles"

8:35 pm - 9:30 pm **Christoph Dellago** (University of Rochester, USA)
 "Proton conduction through water-filled carbon nanotubes"

THURSDAY

7:45 am - 8:45 am Breakfast

9:00 am - 12:30 am **WATER IN EXTREME BIOLOGICAL SYSTEMS**

[[click here for detailed session information](#)]

Discussion Leader: **Roy Daniel** (University of Waikato, New Zealand)

9:00 am - 9:15 am **Roy Daniel** (University of Waikato, New Zealand)
 Introductory remarks

9:15 am - 10:10 am **Peter Halling** (University of Strathclyde, Glasgow, UK)
 "Enzyme action in (relatively) low water media"

10:10 am - 10:40 am Coffee break

10:40 am - 11:35 am **C. Nick Pace** (Texas A&M University, USA)
 "How water affects protein stability"

11:35 am - 12:30 pm **William McKinnon** (Washington University, USA)
 "Water on Europa"

12:30 pm Lunch

4:00 pm - 6:00 pm Poster session

6:00 pm Banquet

7:30 pm - 8:00 pm Business meeting, elections, etc.

8:00 pm - 9:00 pm **THIRTY YEARS AFTER RAHMAN AND STILLINGER'S FIRST SIMULATION: WHAT HAVE WE LEARNED AND WHAT MIGHT COME NEXT?**

[[click here for detailed session information](#)]

Discussion Leader: **Alfons Geiger** (University of Dortmund, Germany)

8:00 pm - 9:00 pm **David Chandler** (University of California, Berkeley, USA)
 "Thirty years after Rahman and Stillinger's first simulation: what have we learned and what might come next?"



WATER & AQUEOUS SOLUTIONS

Holderness School

Aug 4-9, 2002

NOTE: Receipt of Application does not guarantee acceptance to a Conference. Applications are reviewed by the Conference Chair. If the Chair approves your application, you become **Accepted** and you will be sent a personalized link to the GRC online registration site. When you complete the online registration, you become **Registered**.

Only those who have been **Accepted** or **Registered** will have their names listed below. Names of people who have only applied and have yet to be accepted will NOT appear.

| Name | Organization | Participation | Status |
|-------------------------------|--|-------------------|------------|
| C. AUSTEN ANGELL | ARIZONA STATE UNIVERSITY | Speaker | Registered |
| DAVID J ANICK | HARVARD MEDICAL SCHOOL | Poster Presenter | Registered |
| HANK ASHBAUGH | LOS ALAMOS NATIONAL LABS | Poster Presenter | Registered |
| ADEBAYO G AUGUSTINE | UNIVERSITY OF AGRICULTURE, ABEOKUTA | Poster Presenter | Registered |
| MARCIA BAKER | UNIVERSITY OF WASHINGTON | Speaker | Registered |
| MARIE-CLAIRE BELLISSENT-FUNEL | LABORATOIRE LÉON BRILLOUIN (CEA-CNRS) | Poster Presenter | Registered |
| ALBERTO BOTTI | UNIVERSITY OF ROMA TRE | Poster Presenter | Registered |
| DANIEL T BOWRON | ISIS FACILITY | Speaker | Registered |
| FABIO BRUNI | UNIVERSITA DI ROMA TRE | Poster Presenter | Registered |
| VICTORIA BUCH | THE HEBREW UNIVERSITY | Poster Presenter | Registered |
| PIERS BUCHANAN | KING COLLEGE LONDON | Attendee | Registered |
| SERGEY V BULDYREV | BOSTON UNIVERSITY | Poster Presenter | Registered |
| BERNARD F CABANE | CNRS | Attendee | Registered |
| EDWARD W CASTNER | RUTGERS UNIVERSITY | Discussion Leader | Registered |
| DAVID CHANDLER | UNIVERSITY OF CALIFORNIA, BERKELEY | Speaker | Registered |
| MARTIN F CHAPLIN | SOUTH BANK UNIVERSITY | Poster Presenter | Registered |
| YNG-GWEI CHEN | UNIVERSITY OF MARYLAND | Poster Presenter | Registered |
| VIORÉL C CHIAHA | MINERAL.-KRISTALLOGR. INSTITUT DER UNIVERSITÄT GÖ | Poster Presenter | Registered |
| JASON CRAIN | UNIVERSITY OF EDINBURGH | Attendee | Registered |
| ROY M DANIEL | UNIVERSITY OF WAIKATO | Discussion Leader | Registered |
| FRANCOIS H DAVID | CNRS | Poster Presenter | Registered |
| JUAN J DE PABLO | UNIVERSITY OF WISCONSIN, MADISON | Speaker | Registered |
| PABLO DEBENEDETTI | PRINCETON UNIVERSITY | Chair | Registered |
| CHRISTOPH DELLAGO | UNIVERSITY OF ROCHESTER | Speaker | Registered |
| ALFRED DELVILLE | CNRS-CRMD | Poster Presenter | Registered |
| J. PAUL DEVLIN | OKLAHOMA STATE UNIVERSITY | Monitor | Registered |
| SOFIA DIAZ MORENO | ESRF | Attendee | Registered |
| RALPH C DOUGHERTY | FLORIDA STATE UNIVERSITY | Poster Presenter | Registered |
| RACHEL V DUNN | UNIVERSITY OF WAIKATO | Attendee | Registered |
| CHARLES D EADS | P&G CORPORATE RESEARCH DIVISION | Poster Presenter | Registered |
| JOEL D EAVES | MASSACHUSETTS INSTITUTE OF TECHNOLOGY | Poster Presenter | Registered |
| JEFFREY R ERRINGTON | UNIVERSITY AT BUFFALO | Poster Presenter | Registered |
| MARIA CRISTINA FACCHINI | INSTITUTE OF ATMOSPHERIC & CLIMATE SCIENCES (ISAC) | Speaker | Registered |
| MELISSA R FEENEY | PRINCETON UNIVERSITY | Poster Presenter | Registered |
| JOHN L FINNEY | UNIVERSITY COLLEGE LONDON | Chair | Registered |
| GIULIA GALLI | LAWRENCE LIVERMORE NATIONAL LABORATORY | Speaker | Registered |
| SHEKHAR S GARDE | RENSSELAER POLYTECHNIC INSTITUTE | Poster Presenter | Registered |
| ANA M GASPAR | CENTRO DE FISICA DA MATERIA CONDENSADA DA UL | Poster Presenter | Registered |
| ALFONS GEIGER | UNIVERSITAET DORTMUND | Vice Chair | Registered |
| BURKHARD GEIL | TECHNISCHE UNIVERSITAET DARMSTADT | Attendee | Registered |
| PHILLIP L GEISSLER | M.I.T. | Attendee | Registered |
| HAGGAI GILBOA | TECHNION - IIT | Attendee | Registered |

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|------------------------|---|-------------------|------------|
| NICOLAS GIOVAMBATTISTA | BOSTON UNIVERSITY | Poster Presenter | Registered |
| NIR GOLDMAN | UNIVERSITY OF CALIFORNIA BERKELEY | Poster Presenter | Registered |
| NIKOLAY V GOUTEV | CREST, JAPAN SCIENCE AND TECHNOLOGY CORPORATION | Poster Presenter | Registered |
| ANDREAS HALLBRUCKER | UNIVERSITY OF INNSBRUCK | Attendee | Registered |
| PETER HALLING | UNIVERSITY OF STRATHCLYDE | Speaker | Registered |
| MICHAEL R HARPHAM | COLORADO STATE UNIVERSITY | Poster Presenter | Registered |
| KENNETH R HARRIS | UNIVERSITY COLLEGE (UNSW) | Speaker | Registered |
| MICHAEL B HAY | PRINCETON UNIVERSITY | Poster Presenter | Registered |
| BALAZS HETENYI | PRINCETON UNIVERSITY | Poster Presenter | Registered |
| GREG HIRTH | WOODS HOLE OCEANOGRAPHIC INSTITUTION | Speaker | Registered |
| GREGORY L HURA | U.C. BERKELEY | Attendee | Registered |
| K. RUTH INESON | RETIRED | Attendee | Registered |
| HITOSHI KANNO | NATIONAL DEFENSE ACADEMY | Poster Presenter | Registered |
| BRUCE D KAY | PACIFIC NORTHWEST NATIONAL LABORATORY | Poster Presenter | Registered |
| CAROLYN A KOH | KING'S COLLEGE LONDON | Poster Presenter | Registered |
| INGRID KOHL | MASSACHUSETTS INSTITUTE OF TECHNOLOGY | Poster Presenter | Registered |
| THOMAS KOOP | SWISS FEDERAL INSTITUTE OF TECHNOLOGY | Speaker | Registered |
| PETER G KUSALIK | DALHOUSIE UNIVERSITY | Poster Presenter | Registered |
| ZDRAVKO KUTNJAK | JOZEF STEFAN INSTITUTE | Poster Presenter | Registered |
| BRANKA M LADANYI | COLORADO STATE UNIVERSITY | Monitor | Registered |
| ROBERT LAENEN | TU MUENCHEN, PHYSIK-DEPARTMENT E11 | Poster Presenter | Registered |
| JAEHO LEE | BROWN UNIVERSITY | Poster Presenter | Registered |
| SAU L LEE | PRINCETON UNIVERSITY | Attendee | Registered |
| SERGEY LEIKIN | NATIONAL INSTITUTES OF HEALTH | Speaker | Registered |
| CARRIE S LOCK | PRINCETON UNIVERSITY | Attendee | Registered |
| THOMAS LOERTING | MASSACHUSETTS INSTITUTE OF TECHNOLOGY | Poster Presenter | Registered |
| ALENKA LUZAR | UNIVERSITY OF CALIFORNIA SAN FRANCISCO | Poster Presenter | Registered |
| JALEL M'HALLA | FACULTÉ DES SCIENCES DE MONASTIR | Poster Presenter | Registered |
| CRAIG MANNING | UNIVERSITY OF CALIFORNIA, LOS ANGELES | Speaker | Registered |
| ABRAHAM MARMUR | TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY | Poster Presenter | Registered |
| DE BARROS M.I. MARQUES | C.FISICA MATERIA CONDENSADA UNIV. LISBOA | Poster Presenter | Registered |
| M. ALVES MARQUES | C. FIS. MAT. CONDENSADA | Poster Presenter | Registered |
| GLENN J. MARTYNA | IBM RESEARCH : PHYSICAL SCIENCES DIVISION | Poster Presenter | Registered |
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| SATISH MYNENI | PRINCETON UNIVERSITY | Poster Presenter | Registered |
| JOHN F NAGLE | CARNEGIE MELLON UNIVERSITY | Speaker | Registered |
| THOMAS F O'CONNOR | PRINCETON UNIVERSITY | Attendee | Registered |
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| C N PACE | TEXAS A&M UNIVERSITY | Speaker | Registered |
| THOMAS PETER | INSTITUTE OF ATMOSHERIC AND ELIMATE SCIENCE | Discussion Leader | Registered |
| MICHAEL PIKAL | UNIVERSITY OF CONNECTICUT | Speaker | Registered |
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| ROBERT K PRUD'HOMME | PRINCETON UNIVERSITY | Speaker | Registered |
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| GLEN REIN | ESTEE LAUDER COMPANIES | Attendee | Registered |
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| CHRISTOPH G SALZMANN | UNIVERSITY OF INNSBRUCK, AUSTRIA | Poster Presenter | Registered |
| RICHARD J SAYKALLY | UNIVERSITY OF CALIFORNIA, BERKELEY | Vice Chair | Registered |
| FRANCESCO SCIORTINO | UNIVERSITY OF ROME, LA SAPIENZA | Speaker | Registered |
| M. SCOTT SHELL | PRINCETON UNIVERSITY | Attendee | Registered |
| DAVID P SHELTON | UNIVERSITY OF NEVADA, LAS VEGAS | Poster Presenter | Registered |
| VINCENT SHEN | PRINCETON UNIVERSITY | Attendee | Registered |
| MUNIR S SKAF | STATE UNIVERSITY OF CAMPINAS | Poster Presenter | Registered |
| ANNA SKIBINSKY | BOSTON UNIVERSITY | Poster Presenter | Registered |
| NEIL SNIDER | NORTHWESTERN UNIVERSITY | Attendee | Registered |
| ALAN K SOPER | RUTHERFORD APPLETON LABORATORY | Speaker | Registered |
| FRANK H STILLINGER | PRINCETON UNIVERSITY | Discussion Leader | Registered |
| BERND STRUTH | ESRF | Poster Presenter | Registered |

| | | | |
|---------------------|---------------------------------------|-------------------|------------|
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| ALAN THOMPSON | INSTITUTE OF MINERALOGY & PETROGRAPHY | Discussion Leader | Registered |
| ANDREI TOKMAKOFF | MIT | Attendee | Registered |
| TOSHIHIRO TOMINAGA | OKAYAMA UNIVERSITY OF SCIENCE | Poster Presenter | Registered |
| THOMAS M TRUSKETT | UNIVERSITY OF TEXAS AT AUSTIN | Poster Presenter | Registered |
| PIERRE E TURQ | UNIVERSITE PIERRE ET MARIE CURIE | Poster Presenter | Registered |
| JACOB URQUIDI | ARGONNE NATIONAL LABS | Poster Presenter | Registered |
| GEORGE E WALRAFEN | UNIVERSITY OF KANSAS | Attendee | Registered |
| ROBIN E WESTACOTT | HERIOT-WATT UNIVERSITY | Poster Presenter | Registered |
| JUDITH WOLK | UNIVERSITAT ZU KÖLN | Poster Presenter | Registered |
| BARBARA E WYSLOUZIL | WORCESTER POLYTECHNIC INSTITUTE | Poster Presenter | Registered |
| YANFENG ZHANG | PRINCETON UNIVERSITY | Attendee | Registered |
| GEORGE D ZOGRFI | UNIVERSITY OF WISCONSIN, MADISON | Speaker | Registered |

