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GORDON RESEARCH CONFERENCES *frontiers of science*

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Nancy Ryan Gray, Ph.D.

Director

2005 Chemical Reactions at Surfaces
Gordon Research Conference

FINAL PROGRESS REPORT

DOE
DE-FG02-05ER15633

The Gordon Research Conference (GRC) on 2005 Chemical Reactions at Surfaces was held at Ventura Beach Marriott, Ventura California from February 13, 2005 through February 18, 2005. The Conference was well-attended with 124 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In designing the formal speakers program, emphasis was placed on current unpublished research and discussion of the future target areas in this field.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 As you know, in the interest of promoting the presentation of unpublished and frontier-breaking research, Gordon Research Conferences does not permit publication of meeting proceedings.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.

Dr. Cynthia M. Friend
Conference Chair

Chemical Reactions At Surfaces

February 13-18, 2005
Ventura Beach Marriott
Ventura, CA

Chair: [Charles T Campbell](#)
Vice Chair: [Cynthia M Friend](#)

Conference sponsors:

Elsevier Science Publishing
Omicron NanoTechnology USA
Department of Energy Office of Basic Energy Sciences
LK Technology
Pacific Northwest National Labs EMSL

SUNDAY

- 4:00 pm - 9:00 pm Arrival and check-in
- 6:00 pm Dinner
- 7:30 pm - 9:30 pm **IMAGING SURFACE REACTIONS**
- Welcome from Chair: **Charles T. Campbell** (U. Washington)
- Discussion Leader: **Bob Madix** (Stanford University)
- 7:30 pm - 8:30 pm **Flemming Besenbacher** (University of Aarhus)
 "Dynamics processes at surfaces studied by high resolution fast scanning STM"
- 8:30 pm - 9:30 pm **Miguel Salmeron** (Lawrence Berkeley Laboratory)
 "In situ studies of surface reactions: the nature of active sites, adsorbate diffusion and the role of impurities and poisons"

MONDAY

- 7:30 am - 8:30 am Breakfast
- 9:00 am - 12:30 pm **NANOPARTICLES IN CATALYSIS**
- Discussion Leader: **D. Wayne Goodman** (Texas A&M University)
- 9:00 am - 10:00 am **Hajo Freund** (Fritz-Haber-Institut der Max-Planck-Gesellschaft)
 "Nanoparticles as models for heterogeneous catalysts"
- 10:00 am Coffee Break
- 10:15 am - 11:15 am **Donna Chen** (University of South Carolina)
 "Studies of the Growth and Reactivity of TiO₂-Supported Metal Nanoclusters as Models for Heterogeneous Catalysts"
- 11:15 am - 11:30 am Conference Photo (outside nearby)
- 11:30 am - 12:30 pm **Jose Rodriguez** (Brookhaven National Laboratory)
 "The Activation of Gold on Oxide and Carbide Surfaces: Photoemission, XANES and Density-Functional Studies"
- 12:30 pm Lunch
- 1:30 pm - 5:00 pm Free Time
- 5:00 pm - 6:00 pm Poster Set-up (~4-5 pm) / Poster Session I (~5-6 pm)
- Discussion Leader: **J.G. Chen** (University of Delaware)
- 6:00 pm Dinner
- 7:30 pm - 8:30 pm **NANOPARTICLE AND FILM GROWTH**
- Discussion Leader: **Shirley Chiang** (University of California at Davis)
- 7:30 pm - 8:30 pm **John Ekerdt** (The University of Texas at Austin)
 "Nucleation of films and nanoparticles on insulating surfaces"
- 8:30 pm - 11:00 pm Poster Session I (continued)
- Discussion Leader: **J.G. Chen** (University of Delaware)

TUESDAY

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	PHOTOCHEMICAL REACTIONS AT SURFACES
	Discussion Leader: J. Michael White (University of Texas at Austin)
9:00 am - 10:00 am	Yasuhiro Iwasawa (The University of Tokyo) "Reaction sites and mechanisms for thermal and photochemical reactions on TiO ₂ (110), TiO ₂ (001), and CeO ₂ (111) surfaces by STM and NC-AFM"
10:00 am	Coffee Break
10:30 am - 11:30 am	Mike Henderson (Pacific Northwest National Laboratory) "Heterogeneous Photocatalysis on Single Crystal Oxides"
11:30 am - 12:30 pm	Katerina Al-Shamery (Oldenburg University) "(Photo) chemistry at nanoparticulate systems"
12:30 pm	Lunch
1:30 pm - 5:00 pm	Free Time
5:00 pm - 6:00 pm	Poster Set-up (~4-5 pm) / Poster Session II (~5-6 pm) Discussion Leader: Lisa McElwee-White (University of Florida)
6:00 pm	Dinner
7:30 pm - 9:30 pm	SURFACE REACTIONS IN CATALYSIS
	Discussion Leader: Francisco Zaera (University of California Riverside)
7:30 pm - 8:30 pm	Peter Stair (Northwestern University) "The Structure/Chemistry Relationship on Surfaces"
8:30 pm - 9:30 pm	Mark Barteau (University of Delaware) "Turning Surface Science and DFT into new catalysts"
9:30 pm - 11:00 pm	Poster Session II (continued) Discussion Leader: Lisa McElwee-White (University of Florida)

WEDNESDAY

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	ADVANCES IN THEORETICAL MODELLING OF SURFACE REACTIONS
	Discussion Leader: Karsten Reuter (Fritz-Haber Institute, Berlin)
9:00 am - 10:00 am	Bill Schneider (University of Notre Dame) "Catalytic Reactivity at the Intersection of Metals and Oxides"
10:00 am	Coffee Break
10:30 am - 11:30 am	Manos Mavrikakis (The University of Wisconsin - Madison) "Transition Metals Reactivity through DFT: From reaction mechanisms to the identification of promising catalysts"
11:30 am - 12:30 pm	Emily Carter (Princeton University) "Surface and Interface Chemistry Related to Steel Erosion"
12:30 pm	Lunch
1:30 pm - 5:00 pm	Free Time
5:00 pm - 6:00 pm	Poster Set-up (~4-5 pm) / Poster Session III (~5-6 pm) Discussion Leader: Fredrick Henn (Omicron Nanotechnology USA)
6:00 pm	Dinner
7:00 pm - 7:30 pm	BUSINESS MEETING: All participants are expected to attend!
7:30 pm - 9:30 pm	SURFACE REACTIONS IN ENVIRONMENTAL CHEMISTRY & ORGANOFUNCTIONALIZATION
	Discussion Leader: John N. Russell, Jr. (Naval Research Laboratory)
7:30 pm - 8:30 pm	Scot T. Martin (Harvard University) "Surface Chemistry of Environmentally Important Minerals"
8:30 pm - 9:30 pm	Steve Bernasek (Princeton University) "Structure and Reactivity of Self-Assembled Organic Thin Films"
9:30 pm - 11:30 pm	Poster Session III (continued) Discussion Leader: Ian Harrison (University of Virginia)

THURSDAY

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	SURFACE REACTIONS FOR MAKING ELECTRONIC DEVICES Discussion Leader: Stacey Bent (Stanford University)
9:00 am - 10:00 am	Yves Chabal (Rutgers, The State University of New Jersey) "Semiconductor surface chemical functionalization for electronic devices"
10:00 am	Coffee Break
10:30 am - 11:30 am	Jane P. Chang (University of California, Los Angeles) "Surface chemistry in synthesizing and patterning of high-k dielectric materials"
11:30 am - 12:30 pm	Zhenan Bao (Stanford University) "Surface Reactions and Modifications for Organic Thin Film Transistors"
12:30 pm	Lunch
1:30 pm - 5:00 pm	Free Time
5:00 pm - 6:00 pm	Poster Set-up (~4-5 pm) / Poster Session IV (~5-6 pm) Discussion Leader: Jan Hrbek (Brookhaven National Labs)
6:00 pm	Conference Banquet
7:45 pm - 8:45 pm	SURFACE REACTIONS IN BIOTECHNOLOGY Discussion Leader: Paul Cremer (Texas A&M University)
7:45 pm - 8:45 pm	Ralph Nuzzo (University of Illinois at Urbana-Champaign) "Grayscale Patterning of Proteins via Microfluidic Depletion and Dynamics at the Solid-liquid Interface" Closing Remarks by Vice Chair: Cynthia Friend (Harvard University)
8:45 pm - 11:00 pm	Poster Session IV (continued) Discussion Leader: Jan Hrbek (Brookhaven National Labs)

FRIDAY

7:30 am - 8:30 am	Breakfast
9:00 am	Departure

CHEMICAL REACTIONS AT SURFACES

Participant List

Ventura Beach Marriott
Feb 13-18, 2005


Name	Organization	Participation	Status
CRISTINA AFRICH	TRIESTE UNIVERSITY	Poster Presenter	Registered
HIND A AL-ABADLEH	NORTHWESTERN UNIVERSITY	Poster Presenter	Registered
KATERINA AL-SHAMERY	CVO UNIVERSITIY OLDENBURG	Speaker	Registered
ERIC I ALTMAN	YALE UNIVERSITY	Attendee	Registered
MICHAEL ANDERSEN	TECHNICAL UNIVERSITY OF DENMARK	Poster Presenter	Registered
SCOTT L ANDERSON	UNIVERSITY OF UTAH	Poster Presenter	Registered
A T ANGHEL	UNIVERSITY OF CAMBRIDGE	Poster Presenter	Registered
MICHA ASSCHER	HEBREW UNIVERSITY	Poster Presenter	Registered
MARCUS BAEUMER	UNIVERSITY OF BREMEN	Attendee	Registered
ZHENAN BAO	STANFORD UNIVERSITY	Speaker	Registered
DAN E BARLOW	NAVAL RESEARCH LAB	Poster Presenter	Registered
MARK A BARTEAU	UNIVERSITY OF DELAWARE	Speaker	Registered
LUDWIG BARTELS	UNIVERSITY OF CALIFORNIA, RIVERSIDE	Poster Presenter	Registered

CONRAD BECKER	UNIVERSITY OF BONN	Poster Presenter	Registered
STACEY F BENT	STANFORD UNIVERSITY	Discussion Leader	Registered
STEVEN L BERNASEK	PRINCETON UNIVERSITY	Speaker	Registered
FLEMMING BESENBACHER	UNIVERSITY OF AARHUS	Speaker	Registered
UWE BURGHHAUS	NORTH DAKOTA STATE UNIVERSITY	Poster Presenter	Registered
MARK E BUSSELL	WESTERN WASHINGTON UNIVERSITY	Poster Presenter	Registered
CHARLES T CAMPBELL	UNIVERSITY OF WASHINGTON	Chair	Registered
EMILY A CARTER	PRINCETON UNIVERSITY	Speaker	Registered
YVES J CHABAL	RUTGERS UNIVERSITY	Speaker	Registered
JANE P CHANG	UNIVERSITY OF CALIFORNIA, LOS ANGELES	Speaker	Registered
DONNA A CHEN	UNIVERSITY OF SOUTH CAROLINA	Speaker	Registered
JINGGUANG G CHEN	UNIVERSITY OF DELAWARE	Discussion Leader	Registered
SHIRLEY CHIANG	UNIVERSITY OF CALIFORNIA - DAVIS	Discussion Leader	Registered
JU CHOU	UNIVERSITY OF CALIFORNIA	Poster Presenter	Registered
LIANG T CHU	STATE UNIV OF NEW YORK-ALBANY	Poster Presenter	Registered
PAUL S CREMER	TEXAS A&M UNIVERSITY	Discussion Leader	Registered
XINGYI DENG	HARVARD UNIVERSITY	Poster Presenter	Registered
ZDENEK DOHNALEK	PACIFIC NORTHWEST NATIONAL LABORATORY	Poster Presenter	Registered
JOHN G EKERDT	UNIVERSITY OF TEXAS	Speaker	Registered
PEDER J ESTRUP	BROWN UNIVERSITY / UCSB	Attendee	Registered
HOWARD FAIRBROTHER	JOHNS HOPKINS UNIVERSITY	Poster Presenter	Registered
LARRY R FIEGLAND	VIRGINIA TECH	Poster Presenter	Registered
MICHAEL A FILLER	STANFORD UNIVERSITY	Poster Presenter	Registered
ARNOLD J FORMAN	UNIVERSITY OF CALIFORNIA, SANTA BARBARA	Attendee	Accepted
HANS-JOACHIM FREUND	FRITZ-HABER INST. DER MAX-PLANCK-GESELLSCHAFT	Speaker	Registered
ERIK FRIDELL	CHALMERS UNIVERSITY	Poster Presenter	Registered
CYNTHIA M FRIEND	HARVARD UNIVERSITY	Vice Chair	Registered
ETSUKO FUJITA	BROOKHAVEN NATIONAL LABORATORY	Attendee	Registered
ELLEN S GAWALT	DUQUESNE UNIVERSITY	Poster Presenter	Registered
FRANZ M GEIGER	NORTHWESTERN UNIVERSITY	Poster Presenter	Registered
DAVID W GOODMAN	TEXAS A&M UNIVERSITY	Discussion Leader	Registered
JONATHAN JW HARRIS	UNIVERSITY OF WASHINGTON	Poster Presenter	Registered
IAN HARRISON	UNIVERSITY OF VIRGINIA	Discussion Leader	Registered
NILS O HARTMANN	UNIVERSITAET DUISBURG-ESSEN	Poster Presenter	Registered
JOHN C HEMMINGER	UNIVERSITY OF CALIFORNIA, IRVINE	Poster Presenter	Registered
MICHAEL A HENDERSON	PACIFIC NORTHWEST NATIONAL LABORATORY	Speaker	Registered
FREDERIC HENN	OMICRON NANOTECHNOLOGY	Attendee	Registered
KLAUS E HERMANN	FRITZ-HABER-INSTITUT	Poster Presenter	Registered
BERIT HINNEMANN	PRINCETON UNIVERSITY	Poster Presenter	Registered
HIDEYUKI HORINO	HOKKAIDO UNIVERSITY	Attendee	Registered
JAN HRBEK	BROOKHAVEN NATIONAL LABORATORY	Discussion Leader	Registered
ALEXEY IGNATCHENKO	EASTMAN CHEMICAL COMPANY	Attendee	Registered
ALBENA IVANISEVIC	PURDUE UNIVERSITY	Poster Presenter	Registered
YASUHIRO IWASAWA	THE UNIVERSITY OF TOKYO	Speaker	Registered
DU-JEON JANG	SEOUL NATIONAL UNIVERSITY	Poster Presenter	Registered
TON V W JANSSENS	HALDOR TOPSOE A/S	Poster Presenter	Registered
DE-EN JIANG	UNIVERSITY OF CALIFORNIA, LOS ANGELES	Poster Presenter	Registered
STEPHEN JOYCE	LOS ALAMOS NATIONAL LABORATORY	Poster Presenter	Registered
SHAMPA KANDOI	UNIVERSITY OF WISCONSIN-MADISON	Poster Presenter	Registered
GABRIEL KERNER	HEBREW UNIVERSITY	Poster Presenter	Registered
ERWIN KESSELS	EINDHOVEN UNIVERSITY OF TECHNOLOGY	Poster Presenter	Registered
YOUSOO KIM	RIKEN	Poster Presenter	Registered
JOHO KIM	PACIFIC NORTHWEST NATIONAL LABORATORY	Poster Presenter	Registered
JENNIFER E KLARE	COLUMBIA UNIVERSITY	Poster Presenter	Registered
ANDREAS KLUST	STANFORD UNIVERSITY	Poster Presenter	Registered
BRUCE E KOEL	UNIVERSITY OF SOUTHERN CALIFORNIA	Poster Presenter	Registered

HIROSHI KONDOH	UNIVERSITY OF TOKYO	Poster Presenter	Registered
JYH SHING LIN	TAMKANG UNIVERSITY	Poster Presenter	Registered
DA-JIANG LIU	IOWA STATE UNIVESRITY	Poster Presenter	Registered
ZHIFENG LIU	CHINESE UNIVERSITY OF HONG KONG	Poster Presenter	Registered
PING LIU	FUJIAN INS. OF RES.ON THE STRUC.OF MAT.,CAS	Poster Presenter	Registered
CORINA LUPU	RICE UNIVERSITY	Poster Presenter	Registered
OLE LYTKEN	TECHNICAL UNIVERSITY OF DENMARK	Poster Presenter	Registered
JERRY S MACALA	UNIVERSITY OF CALIFORNIA, SANTA BARBARA	Attendee	Registered
ROBERT J MADIX	STANFORD UNIVERSITY	Discussion Leader	Registered
SCOT MARTIN	HARVARD UNIVERSITY	Speaker	Registered
NICHOLAS F MATERER	OKLAHOMA STATE UNIVERSITY	Attendee	Registered
TATSUO T MATSUSHIMA	HOKKAIDO UNIVERSITY CRC	Poster Presenter	Registered
MANOS MAVRIKAKIS	UNIVERSITY OF WISCONSIN, MADISON	Speaker	Registered
JOHN R MCCORMICK	UNIVERSITY OF DELAWARE	Poster Presenter	Registered
LISA MCELWEE-WHITE	UNIVERSITY OF FLORIDA	Discussion Leader	Registered
THOMAS MEBRAHTU	AIR PRODUCTS AND CHEMICALS, INC.	Poster Presenter	Registered
ERIK J MENKE	UNIVERSITY OF CALIFORNIA, IRVINE	Poster Presenter	Registered
RANDALL MEYER	UNIVERSITY OF ILLINOIS-CHICAGO	Poster Presenter	Registered
BYOUNG KOUN MIN	HARVARD UNIVERSITY	Poster Presenter	Registered
RAUL MIRANDA	U.S. DOE BASIC ENERGY SCIENCES	Attendee	Registered
RICARDO A MORALES	UNIVERSITY OF CALIFORNIA, RIVERSIDE	Poster Presenter	Registered
JOHN R MORRIS	VIRGINIA TECH	Poster Presenter	Registered
JAMES T MUCKERMAN	BROOKHAVEN NATIONAL LABORATORY	Poster Presenter	Registered
LUIS E MURILLO	UNIVERSITY OF DELAWARE	Poster Presenter	Registered
SUDARSHAN NATARAJAN	PENN STATE	Poster Presenter	Registered
KJELL E NELSON	UNIVERSITY OF WASHINGTON	Poster Presenter	Registered
RALPH G NUZZO	UNIVERSITY OF ILLINOIS	Speaker	Registered
RICHARD OSGOOD	COLUMBIA UNIVERSITY	Poster Presenter	Registered
SIMON SP PENNER	UNIVERSITY OF WASHINGTON	Poster Presenter	Registered
DENIS V POTAPENKO	BROOKHAVEN NATIONAL LABORATORY	Poster Presenter	Registered
KARSTEN REUTER	FRITZ-HABER INSTITUTE	Discussion Leader	Registered
JEFFREY T ROBERTS	UNIVERSITY OF MINNESOTA	Poster Presenter	Registered
JOSE A RODRIGUEZ	BROOKHAVEN NATIONAL LABORATORY	Speaker	Registered
GUNTHER RUPPRECHTER	VIENNA UNIVERSITY OF TECHNOLOGY	Poster Presenter	Registered
JOHN N RUSSELL	NAVAL RESEARCH LABORATORY	Discussion Leader	Registered
MIQUEL SALMERON	LAWRENCE BERKELEY LABORATORY	Speaker	Registered
TOBIAS SCHALOW	FRITZ-HABER-INSTITUT DER MPG	Poster Presenter	Registered
RENALD SCHAUB	UNIVERSITY OF AARHUS	Attendee	Registered
WILLIAM F SCHNEIDER	UNIVERSITY OF NOTRE DAME	Speaker	Registered
TODD C SCHWENDEMANN	UNIVERSITY OF VIRGINIA	Poster Presenter	Registered
SHAMIL SHAIKHUTDINOV	FRITZ HABER INSTITUTE	Poster Presenter	Registered
NOAH SHAMIR	NUCLEAR RESEARCH CENTER - NEGEV	Poster Presenter	Registered
GEOFFREY D SMITH	UNIVERSITY OF GEORGIA	Poster Presenter	Registered
ZHEN SONG	COLUMBIA UNIVERSITY	Poster Presenter	Registered
PETER C STAIR	NORTHWESTERN UNIVERSITY	Speaker	Registered
MICHAEL M SUSHCHIKH	UNIVERSITY OF CALIFORNIA, SANTA BARBARA	Poster Presenter	Registered
JANOS SZANYI	PACIFIC NORTHWEST NATIONAL LABORATORY	Poster Presenter	Registered
MIZUKI TADA	UNIVERSITY OF TOKYO	Poster Presenter	Registered
MICHAEL TRENARY	UNIVERSITY OF ILLINOIS AT CHICAGO	Poster Presenter	Registered
TRINH TU VAN	UNIVERSITY OF CALIFORNIA, LOS ANGELES	Poster Presenter	Registered
EBBE K VESTERGAARD	UNIVERSITY OF WASHINGTON	Poster Presenter	Registered
J. MICHAEL WHITE	UNIVERSITY OF TEXAS AT AUSTIN	Discussion Leader	Registered
YONG YANG	UNIVERSITY OF CALIFORNIA,	Poster Presenter	Registered
BYUNGKUK YOO	SEOUL NATIONAL UNIVERSITY	Poster Presenter	Registered
FRANCISCO ZAERA	UNIVERSITY OF CALIFORNIA-RIVERSIDE	Discussion Leader	Registered
MICHAEL B ZELLNER	UNIVERSITY OF DELAWARE	Poster Presenter	Registered

FINANCIAL STATUS REPORT

(Follow instructions on the back.)

1. FEDERAL AGENCY AND ORGANIZATIONAL ELEMENT TO WHICH REPORT IS SUBMITTED Earlette M. Robinson U.S. Department of Energy/ACQ Chicago Operations Office 9800 South Cass Avenue Argonne, IL 60439		2. FEDERAL GRANT OR OTHER IDENTIFYING NUMBER DE-FG02-05ER15633		OMB Approved No. 80-R0180	
3. RECIPIENT ORGANIZATION (Name and complete address, including ZIP code) Gordon Research Conferences PO Box 984 West Kingston, RI 02892-0984		4. EMPLOYER IDENTIFICATION NUMBER 050300482			
		5. RECIPIENT ACCOUNT NUMBER OR IDENTIFYING NO.			
		6. FINAL REPORT <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		7. BASIS <input checked="" type="checkbox"/> CASH <input type="checkbox"/> ACCRUAL	
8. PROJECT/GRANT PERIOD (See instructions)		9. PERIOD COVERED BY THIS REPORT			
FROM (Month, day, year) 01/01/2005	TO (Month, day, year) 12/31/2005	FROM (Month, day, year) 01/01/2005	TO (Month, day, year) 12/31/2005		
10. STATUS OF FUNDS					
a. Net outlays previously reported				\$ 0.00	
b. Total outlays this report period				6,000	
c. Less: Program income credits				0.00	
d. Net outlays this report period (Line a minus line c)				6,000	
e. Net outlays to date (Line a plus line d)				6,000	
f. Less: Non-Federal share of outlays				0	
g. Total Federal share of outlays (Line e minus line f)				6,000	
h. Total unliquidated obligations				0.00	
i. Less: Non-Federal share of unliquidated obligations shown on line h				0.00	
j. Federal share of unliquidated obligations (Line h minus line i)				0.00	
k. Total Federal share of outlays and unliquidated obligations (Line g plus j)				6,000	
l. Total cumulative amount of Federal funds authorized				6,000	
m. Unobligated balance of Federal funds (Line l minus line k)				0.00	
11. INDIRECT EXPENSE		a TYPE OF RATE (Place "X" in appropriate box) <input type="checkbox"/> PROVISIONAL <input type="checkbox"/> PREDETERMINED <input type="checkbox"/> FINAL <input type="checkbox"/> FIXED			
		b. RATE	c. BASE	d. TOTAL AMOUNT	e. FEDERAL SHARE
12. REMARKS (Attach any explanations deemed necessary or information required by Federal sponsoring agency in compliance with governing legislation.) 2005 Chemical Reactions at Surfaces					
13. CERTIFICATION I certify to the best of my knowledge and belief that this report is correct and complete and that all outlays and unliquidated obligations are for the purposes set forth in the award documents		SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL 		DATE REPORT SUBMITTED March 14, 2006	
		TYPED OR PRINTED NAME AND TITLE Nancy Ryan Gray, Director		TELEPHONE (Area code, number, and extension) 401-783-4011	
DISTRIBUTION: Copy 1 - Official Grant File Copy 2 - Grants Section, FAAB Copy 3 - Grantee			STANDARD FORM 269 (7-76) Prescribed by Office of Management and Budget Cir. No. A-110		

FINANCIAL ASSISTANCE
PROPERTY CERTIFICATION

AWARDEE Gordon Research Conferences

AWARD NO. DE-FG02-05ER15633

The DOE Assistance Rules, 10 CFR 600, define property acquired under the terms of the award as either exempt (purchased with DOE operating dollars) or non-exempt (acquired with DOE capital equipment dollars, Government-furnished or acquired from the Government excess property lists). Non-exempt property is normally identified in the award document as Government-owned and requires a Semi-Annual Summary Report of DOE-Owned Plant and Capital Equipment to be submitted **annually** pursuant to DOE regulations.

In order to facilitate grant closeout, please review your property records and complete the applicable Item I, for exempt property, or Item II, for non-exempt property, of this certificate and return it to the Contracting Officer as soon as possible.

- I. There was no reportable residual exempt property of any description at the completion of this award.

SIGNATURE



TITLE Director

DATE March 14, 2006

- II A final inventory of residual non-exempt property is enclosed for the category (or categories) checked below:

- () A. NONEXPENDABLE PERSONAL PROPERTY, Federally-Owned (acquired with Capital Equipment funds, Government-furnished equipment, or through excess)
- () B. EXPENDABLE PERSONAL PROPERTY (SUPPLIES), if fair market value exceeds \$5,000.

Except for the category (categories) checked above, no other reportable residual property Of any description remained on this award at its completion.

SIGNATURE _____

TITLE _____ DATE _____

PATENT CERTIFICATION

Gordon Research Conferences

Awardee

☐ Interim Certification

DOE Prime and/or Subcontract Nos.

☒ Final Certification

Awardee hereby certifies unless indicated to the contrary, that:

1. All procedures for identifying and disclosing subject inventions as required by the patent clause of the contract have been followed throughout the reporting period.
2. There were no subcontracts or purchase orders involving research, development, and demonstration except as follows: (a separate certification must be provided to DOE for each subcontract or purchase order awarded.)
3. No inventions or discoveries were made or conceived in the course of or under this contract other than the following (Certification includes ☐, does not include ☐ all subcontracts):

<u>TITLE</u>	<u>INVENTOR</u>	<u>DATE REPORTED</u>	<u>DOE "S" NO.*</u>
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NONE

4. The completion date of this contract is as follows: 12/31/2005 Award# DE-FG02-05ER15633
5. The following period is covered by this certification:

<u>01/01/2005</u>	to	<u>12/31/2005</u>
Month Day Year		Month Day Year

Gordon Research Conferences

Contractor



Signature

PO Box 984

Director

Title

W. Kingston, RI 02892

Address

March 14, 2006

Date of Certification

* Also include Subcontract No. if available.

NOTE: A positive certification for this Item 3 does not negate the requirement for furnishing to DOE a fully executed Patent Certification from each subawardee identified in Item 2.