

REPORT DOCUMENTATION PAGE

AFRL-SR-BL-TR-01-

0965

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1. REPORT DATE (DD-MM-YYYY) 15-10-2001		2. REPORT TYPE Final Technical		3. DATES COVERED (From - To) 01-07-2001 - 30-09-2001	
4. TITLE AND SUBTITLE (U) Partial Support of the Laser Diagnostics of Combustion Gordon Research Conference				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER F49620-01-1-0451	
				5c. PROGRAM ELEMENT NUMBER 61102F	
6. AUTHOR(S) Jay Jeffries				5d. PROJECT NUMBER 2308	
				5e. TASK NUMBER BX	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) P.O. Box 984 West Kingston RI 02892-0984				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) AFOSR/NA 801 North Randolph Street Room 732 Arlington VA 22203-1977				<div style="text-align: center; font-size: 2em; font-weight: bold;">20011126 094</div> 11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The Gordon Research Conference on Laser Diagnostics was held at Mount Holyoke College, South Hadley MA on 1-6 July 2001. The conference included 130 participants. Research discussed at the conference included quantitative measurements to test combustion chemistry, picosecond measurements to quantify collisional effects, infrared diagnostics, velocity measurements, measurement techniques for fuel distributions, diagnostics to understand turbulent flow, innovative optical measurement techniques, practical measurements in harsh engine environments, and quantitative measurements to understand soot formation.					
15. SUBJECT TERMS laser diode spectroscopy velocimetry soot combustion turbulence picosecond					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
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2001 GORDON RESEARCH CONFERENCE

on Laser Diagnostics in Combustion

FINAL PROGRESS REPORT

AFOSR

F49620-01-1-0451

The Gordon Research Conference (GRC) on Laser Diagnostics in Combustion was held at Mount Holyoke College, South Hadley, MA, July 1-6, 2001. The conference was well attended with 130 participants (list enclosed). The attendees represented the spectrum of endeavor in this field coming from academia, industry, and government laboratories, both US 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. 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 (program enclosed).

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.

Jay Jeffries
Conference Chair

Laser Diagnostics in Combustion

Mount Holyoke College
South Hadley, MA
July 1-6, 2001

Jay B. Jeffries, Chair
Marcus Alden, Vice Chair

Visit the [Conference Home Page](#) for more information.

Sunday, July 1

6:00-7:00 PM Dinner

7:15 PM Welcome to the Conference and Announcements:
Jay Jeffries, Stanford University, Conference Chair

Sunday PM, July 1 Session I

Quantitative Measurements to Test Combustion Chemistry

Discussion Leader: **Gregory P. Smith** (SRI International)

7:30-9:30 PM **Pascale Desgroux** (University of Science and Technology of Lille)
Cavity Ringdown Measurements of Minor Species in Flames: Impact on Combustion Chemistry

Dr. Andrew McIlroy (Sandia National Laboratory)
"Cavity Ringdown Spectroscopy for Quantitative Combustion Measurements"

9:30 - 10 PM "A Remembrance for the late Professor Peter Andresen"
Professor Katharina Kohse-Hoeinghaus, University of Bielefeld
Professor Erhard Rothe, Wayne State University
Dr. Gerd Gruenefeld, RWTH Aachen

Monday AM, July 2 Session 2

ps Measurements to Quantify Collisional Effects

Discussion Leader: **Professor Jürgen Wolfrum** (University of Heidelberg)

7:30-8:30 AM Breakfast (*)

9:00-10:00 AM

Andreas Brockhinke (University of Bielefeld)
Evolution of Spectra by Energy Transfer -- Implications for Flame Measurements

10:00 AM Group photo / Coffee break

10:30-12:30 PM **Roger Farrow** (Combustion Research Facility, Sandia National Laboratory)
Measurements of Molecular Energy Transfer Using ps Lasers
Robert Lucht (Texas A&M University)
The Physics of Short Pulse Polarization Spectroscopy

12:30-13:30 PM Lunch (**)

5:00-6:00 PM Poster Session: **Marcus Alden** Lund, Sweden, Conference Vice-Chair

6:00-7:00 PM Dinner

Monday PM, July 2
Session 3

Infrared Diagnostics to Exploit New Tools

Discussion Leader: **Professor Philip Varghese** (University of Texas)

7:30-9:30 **Anatoliy Kosterev**, Rice University
Gas sensing applications of quantum cascade lasers

Brian Kirby Sandia National Laboratory
PLIF Imaging Schemes Using Infrared Laser Sources and Vibrational Fluorescence

9:30 PM Poster Session continues

Tuesday AM, July 3
Session 4

Velocity Measurements: Challenges and Solutions

Discussion Leader: **Mark Allen** (Physical Sciences, Inc.)

7:30-8:30 AM Breakfast (*)

9:00-10:00 AM **Marshall Long** (Yale University)
Velocity from Scalars -- Can this really work?

10:00 AM Coffee break

10:30-12:30 PM **Robert Pitz** (Vanderbilt University)
Molecular Tagging Velocimetry
Richard Schodl (DLR Cologne)
Laser Velocimetry for Combustor Flow Analysis

12:30-1:30 PM Lunch (**)

5:00-6:00 PM Poster Session

6:00-7:00 PM Dinner

Tuesday PM, July 3
Session 5

Challenges in the Measurement of Fuel Distributions

Discussion Leader: **Dr. Nico Dam**, Katholieke Universiteit Nijmegen

7:30-9:30 PM **Christof Schulz** (University of Heidelberg)
Fuel Tracer-LIF Techniques: Possibilities and Pitfalls
Douglas Greenhalgh (Cranfield University)
Optical Diagnostics for Practical Two-Phase Fuel Injection

9:30 PM Poster Session continues

Wednesday AM, July 4
Session 6

Diagnostics to Understand Turbulent Flow

Discussion Leader: **Robert Barlow** (Combustion Research Facility, Sandia National Laboratory)

7:30-8:30 AM Breakfast (*)

9:00-10:00 AM **Andreas Dreizler** (Technical University of Darmstadt)
Gas Turbine Combustion: A Challenging Task for Laser Diagnostics

10:00-10:15 AM Conference Survey: **Jay Jeffries**, Stanford University, Conference Chair

10:00 AM Coffee Break

10:30-12:30 PM **Juan-Carlos Rolon** (Ecole Centrale of Paris)
Laser Diagnostics to Understand Flame-Vortex Interactions
Alfred Leipertz (University of Erlangen-Nürnberg)
Simultaneous 2D Velocity and Gas Temperature Measurements using a Combined PIV and Filtered Rayleigh Technique

12:30-13:30 PM Lunch (**)

5:00-6:00 PM Poster Session

6:00-7:00 PM Dinner
7:15-7:30 PM Business Meeting / Conference Vote

Wednesday PM, July 4
Session 7

Innovative Optical Measurement Techniques

Discussion Leader: **Paul Ewart** (Oxford University)

7:30-9:30 PM **Richard Miles** (Princeton University)
A Renaissance in Raman Imaging using Dispersive and Fluorescent Atomic Filters
Maira Hilton (Reading University)
FTIR Spectroscopy of Gas Turbine Engine Exhaust Emissions

9:30 PM Results of Conference Vote: **Marcus Alden**, Lund, Sweden, Conference Vice-Chair

9:45 PM Poster Session continues

Thursday AM, July 5
Session 8

Practical Measurements in Harsh Environments: Engines

Discussion Leader: **Volker Sick** (University of Michigan)

7:30-8:30 AM Breakfast (*)

9:00-10:00 AM **Hans ter Meulen** (Catholic University of Nijmegen)
Laser Diagnostics in a Heavy Diesel Engine

10:00 AM Coffee break

10:30-12:30 PM **Mike Drake** (General Motors Research Laboratory)
Designer[®] Diagnostics for Gasoline Direct Injection Engines
Scott Sanders (Stanford University)
Multiplexed Diode Laser Sensors for Multi-Parameter Measurements in Pulse Detonation Engines

12:30-1:30 PM Lunch (**)

5:00-6:00 PM Poster Session

6:00-7:00 PM Dinner

Thursday PM, July 5
Session 9

Quantitative Measurements to Understand Soot Formation

Discussion Leader: **Robert Santoro** (Penn State University)

7:30-9:30 PM **Christopher Shaddix** (Combustion Research Facility, Sandia National Laboratory)
Nanoscale Insights into the LII Process and Implications for its Use as a Soot Diagnostic
Frederik Ossler (Lund Institute of Technology)
Picosecond Laser-Induced Emission from PAH at Elevated Temperatures

9:30 PM Poster Session continues

Friday, July 6

7:30-8:30 AM Breakfast
End of conference

(*) The time after breakfast should be used to remove the posters of the previous session.

(**) During the break in the afternoon the posters for the evening session can be put up.

Poster presenters present for discussions (5:00-6:00 PM and 9:30-10:30 PM).



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Last Updated: 5/14/01 by [Jeff Mead](#)

LASER DIAGNOSTICS IN COMBUSTION

Mount Holyoke College, South Hadley, MA
(01-Jul-01) - (06-Jul-01)

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 a registration packet will be mailed immediately. Please allow 3-5 days for your registration to reach you by mail once your name appears. When your registration packet has been received back in our office, 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
<u>MARCUS ALDEN</u>	LUND INSTITUTE OF TECHNOLOGY	Vice Chair	Registered
<u>MARK G ALLEN</u>	PHYSICAL SCIENCES, INC.	Speaker	Registered
<u>ZEYAD T ALWAHABI</u>	ADELAIDE UNIVERSITY	Poster Presenter	Registered
<u>BURAK ATAKAN</u>	UNIVERSITAET BIELEFELD	Poster Presenter	Registered
<u>ROBERT S BARLOW</u>	SANDIA NATIONAL LABORATORIES	Speaker	Registered
<u>PER-ERIK C BENGTSSON</u>	LUND INSTITUTE OF TECHNOLOGY	Poster Presenter	Registered
<u>WOLFGANG G BESSLER</u>	UNIVERSITY OF HEIDELBERG	Poster Presenter	Registered
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