

Reviewed and Revised Papers Presented at the

23rd International Laser Radar Conference

24-28 July 2006

Nara, Japan

Editors : Chikao Nagasawa, Nobuo Sugimoto

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Preface

The International Laser Radar Conference (ILRC) is traditionally the Conference where scientists and engineers from all over the world working in the field of laser radar (or lidar) applied to the atmosphere, earth, and oceans meet together over the years. This Conference is held biennially under the auspices of the International Coordination-group for Laser Atmospheric Studies (ICLAS), of the International Radiation Commission, International Association of Meteorology and Atmospheric Physics.

The 23rd International Laser Radar Conference (ILRC23) was held in Nara City, Japan on July 24th - 28th, 2006. Nara is located in the central part of the main island of Japan. It was the first permanent capital of Japan in the 8th century, and the cradle of Japanese culture, arts and crafts. Several temples and shrines in Nara are listed as World Heritage sites by UNESCO. The ILRC has been held at Sendai in Japan, in 1974 and 1994, and this is third time in Japan.

The papers collected in this book were reviewed by at least one member of the Program Committee and time was allotted for minor revisions by the authors. It contains no parallel session other than poster sessions, which are held separately from the oral sessions. A lot of papers are submitted for the ILRC23. This allows for approximately 82 oral and 215 poster presentations which contain 16 post deadline papers. Total number of submitted papers may be maximum in ILRC history. As many papers are presented in poster sessions, to miss the poster sessions is to miss most of the content of the ILRC23.

As will be seen in the many excellent papers contained in this volume, remote lidar technology, lidar network and its space application are in a period of providing fresh and detailed features of our earth. The lidar technology will be expected still harder for contribution to the advancement of atmospheric science and the improvement of human life.

The editors would like to thank all the Conference Committees for their enthusiastic, careful and punctual work. The success of this conference would not have been possible without the excellent dedication of the session chairs and many authors of the high quality papers contained herein.

Chikao Nagasawa and Nobuo Sugimoto

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Constitution and Bylaws

29 January 2004

CONSTITUTION

Article I. Name

This Society shall be called the International Coordination-Group on Laser Atmospheric Studies (ICLAS). The ICLAS is a nonprofit, constituent Working Group of the International Radiation Commission (IRC).

Article II. Objectives

1. The Society shall work to promote the study of the environmental and geological sciences, climate, meteorology, pollution, and atmospheric physics as elements of Earth and planetary sciences.
2. The Society shall promote the study of the atmospheres of the Earth and planets. This study shall include the interrelated physical, chemical and biological processes and their relationship to climate and to other geophysical and geographical matters.
3. The Society shall promote the development and application of laser sensing techniques and laser instrument architectures used to study the atmospheres of the Earth and other planets.
4. The Society shall encourage the clear scientific basis to the understanding of atmospheric physics and its applications, including the transfer of knowledge on planning, engineering, management, and economic aspects.
5. The Society shall promote the examination of the environmental effects of the evolving use and management of air resources by humans.
6. The Society shall promote advanced technologies in laser remote sensing and the deployment of laser remote sensors on surface-, air-, and space-based platforms for the purposes and objectives outlined in Article II, § 1, 2, 3, 4, and 5.
7. The Society shall offer a forum for discussion,

comparison, and publication of research results.

8. The Society shall further education at all possible levels, especially at graduate, Ph.D., and postdoctoral levels.
9. The Society shall encourage, facilitate, and coordinate research into and investigation of atmospheric and environmental problems and networking and space-based activities that require international cooperation.
10. The Society shall sponsor and encourage workshops and topical meetings for developing standard practices in the utilization of lidars, in their calibration procedures, in their safe use, and in mathematical techniques for determining the informational content of their data.
11. The Society shall be a USA-Registered nonprofit organization, and none of its net income or net worth shall inure to the benefit of its members. Its membership and activities shall be international in scope.

Article III. Offices and Membership

1. The ICLAS membership shall be comprised of individuals interested in the advancement of the objectives of the Society.
2. The elective officers of the ICLAS shall be:

The President, who shall be the Chairman
The Working Group
The Executive Committee
3. The term of office of the President shall be six years. Current and Past Presidents are ineligible for reelection.
4. Working Group members shall have six-year terms. Under extenuating circumstances, a two-year extension

may be granted to any member of the Working Group by a simple majority vote of the President and other Working Group members.

5. Executive Committee members in charge of Awards, Membership, and the Treasury shall have no term limitation. Past Presidents shall serve a six-year term on the Executive Committee immediately following their term as President.

Article IV. Nominations and Elections

1. Each nomination for ICLAS membership shall be submitted to the President or the Executive Committee in writing and include a résumé of the candidate's qualifications.

New members shall be elected by a simple majority of votes during an appropriate Members-Only Business Meeting (MOBM). The voting members include the President and members of the Working Group.

2. The Executive Committee person in charge of membership and the current President shall request nominations for the office of the President at least three months before the next International Laser Radar Conference (ILRC). A nominee must be a member of ICLAS.

The election of the President shall be conducted at a MOBM of the ICLAS. Each eligible member must be present to vote and is entitled to one vote. The votes shall be cast by secret ballot. The President shall be elected by a simple majority of votes. In the event of a tie in the first round of voting, a second round shall be held including only first-place candidates from the first round.

In the event of a tie in the second round of voting, the Executive Committee shall decide between the candidates and that person shall be declared elected. (If there exists an even number of Executive Committee members, the President shall vote with the Executive Committee in the third round.)

3. The Executive Committee person in charge of membership shall inform all participants of the

previous ILRC of upcoming vacancies in the Working Group at least three months prior to the next ILRC. At that time, nominations may be submitted for consideration of the ICLAS. On the basis of available nominations, a list of candidates will be established seeking to achieve a reasonable balance in their geographical and professional distribution.

4. The President and the Working Group shall elect the Executive Committee members by a simple majority vote.

The Past President becomes an ex officio member of the Executive Committee for a six-year term when the President-elect takes office.

Article V. Meetings

1. Meetings of members shall be held at a time and place designated by the President and the Executive Committee. Notice of each meeting shall be given to the membership no fewer than 60 days prior to the date on which the meeting shall be held. A quorum is constituted when at least 50 percent of the voting members of ICLAS are present.

2. The International Laser Radar Conferences (ILRCs) gather the laser remote sensing community and are convened during the even years, e.g. 2002. The ILRCs are held under the auspices of the ICLAS. ICLAS encourages conveners of national meetings covering similar technologies be held in odd years so as not to conflict with ILRCs.

3. The ICLAS shall support Topical Meetings and specific Working Groups after approval by a simple majority vote of the ICLAS.

Article VI. Amendments to the Constitution

Pursuant to the Constitution and Bylaws, the ICLAS shall have the power to adopt or amend the Constitution. The proposed amendment must be approved by a two-thirds majority vote of the ICLAS members eligible to vote.

Bylaws

Article VII. Parliamentary Authority

The rules contained in the current edition of Robert's Rules of Order Newly Revised shall govern the Society in all cases to which they are applicable and in which they are not inconsistent with the Constitution and these Bylaws and any special rules of order the Society may adopt.

Article VIII. Offices and Duties

1. The President

- A. The President of the ICLAS shall be the executive officer.
- B. Subject to appeal, it is the duty of the President to direct affairs in accordance with the Constitution, Bylaws, and decisions of the ICLAS.
- C. It is the duty of the President to manage the business of the ICLAS; to preside at all meetings, call them to order, and allow motions to be heard; to preserve order and decorum; to conduct correspondence; and, to preserve and distribute the official documents and administrative records of ICLAS.

2. The Executive Committee

- A. The Executive Committee is charged with managing funds, membership, awards, and honors.
- B. The members of the Executive Committee may participate in discussions but are not eligible to vote.

3. The President and a member of the Executive Committee shall manage nominations and membership.

4. The President and a member of the Executive Committee shall maintain the Constitution and Bylaws.

5. The President and the members of the Executive Committee shall keep a record of ICLAS activities and proceedings.

6. The Treasurer shall collect the funds and disburse them in accordance with the decisions of the ICLAS.

- A. The funds of the ICLAS shall be deposited in

investment accounts of the ICLAS. Subject to appeal, they shall be at the disposal of the President and the Treasurer

- B. The Treasurer shall maintain records of all financial transactions and submit regular reports to the ICLAS.
- C. The Treasurer shall be a member of the Executive Committee.

7. It is the duty of the Working Group to conduct business as needed and represent constituent communities.

Article IX. Panels, Working Groups, and Rapporteurs

The ICLAS may create panels and Working Groups and may appoint rapporteurs. The President, to whom they shall report, shall appoint the Chairman and members of all such groups. Such groups shall exist only during the term between two successive ILRCs.

Article X. The International Laser Radar Conferences (ILRCs)

1. ILRC locations shall alternate between North America, Europe, and other countries and locations where meeting logistics and travel are feasible.

2. The ICLAS shall convene meetings at least twice during each ILRC. One of these meetings shall be a Members-Only Business Meeting where the President and the Working Group hold elections and conduct other business. The second shall be an Open Business Meeting.

3. The ILRCs are open to all scientists, and supporting engineers and technicians.

4. Four months after each ILRC, the ICLAS under the President's purview shall select the organizing committee and the location of the next ILRC pursuant to the proposals received. The next ILRC's Conference Chairman and his/her staff are responsible for all ILRC matters. The Conference Chairman of the ILRC shall keep the ICLAS President and Executive Committee informed of all activities associated with the organization of the ILRC.

Article XI. Publications

The President shall publish the Constitution and Bylaws in the ILRC book of abstracts and all follow-up publications.

Article XII. Prizes and Awards

1. Lifetime Achievement Award

A member of the Executive Committee is responsible for the Lifetime Achievement Award. The Lifetime Achievement Award recognizes exceptional contributions pursuant to the Society's objectives and is the most prestigious honor awarded by the ICLAS. The Lifetime Achievement Award shall be given once every two years to a single member. Those honored shall receive a clock or other appropriate award.

2. Inaba Prize

The ICLAS is responsible for the Inaba Prize, which is awarded for the best paper at the ILRC senior-authored by a scientist younger than 40 years of age. The Inaba prize includes one thousand two hundred US dollars and a plaque.

3. ILRC Awards

Some members associated with leadership positions of the hosting organization for an ILRC should receive plaques from the ICLAS that recognize their efforts. Typically, one plaque each is awarded to the Conference Chairman, the Chairman of the local Organizing Committee, and the Chairman of the Paper Selection Committee.

Article XIII. Official Language

English shall be the official language of the ICLAS and the ILRCs. The Constitution and Bylaws shall be prepared in English.

Article XIV. Amendments to the Bylaws

Pursuant to the Constitution and Bylaws, the ICLAS shall have the power to adopt or amend the Bylaws. The proposed amendment must be approved by a simple majority vote of the ICLAS members eligible to vote.

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- PD1-2 **Improving CALIPSO Lidar Retrievals of Surface Level Backscatter as a Proxy for PM_{2.5} Using MODIS Path Reflectance Constraints**
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- PD1-3 **The RIVM Mobile Lidar – Design and Operation of a Versatile System for Measuring Atmospheric Trace Gases**
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- PD1-4 **A Compact, Rapidly Tunable Ce:LiCAF DIAL Transmitter for Airborne Ozone Measurements**
Coorg R. Prasad, Victor A. Fromzel, Wenhui Shi, Chris S. Wilks, Russell De Young (Science and Engineering Services, Inc.)
- PD1-5 **NASA Langley Airborne High Spectral Resolution Lidar Instrument Description**
David B. Harper, Anthony Cook, Chris Hostetler, John W. Hair, Terry L. Mack (NASA Langley Research Center)
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- PD2-2 **Performance Estimates of the Phoenix Mars Scout Lidar System**
Cameron S. Dickinson, Thomas J. Duck (Dalhousie University, Department of Physics and Atmospheric Science)
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- PD2-4 **NLC, Potassium Densities and Temperatures by Lidar and Falling Sphere at Spitsbergen, 78° N**
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- PD2-7 **Observation and Model Analysis of a Long-Range Transport Event of Asian Dust and Pollutants to Taiwan**
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- PD2-8 **Optical Properties of Lidar-Observed PSC on the Early Stage of PSC Formation over Dome Station, Antarctic**
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- PD2-9 **Characterization of Biomass Burning Aerosols from Microlidar and Co-Located Observations at Djougou (Benin) during AMMA/SOP 0**
J. Pelon, M. Mallet, A. Mariscal, S. Crewell, S. Victori, P. Goloub, J. Haywood (SA-LMD/IPSL, CNRS)
- PD2-10 **Cloud-Aerosols Spin-Off Products Relevant to Climate Monitoring to be Provided by the "ADM - ÆOLUS" ESA's Wind Mission: the L2A Data Processor and New Concept of Integrated Two-Way Transmission**
Pierre H. Flamant (Laboratoire de Météorologie Dynamique Institut Pierre Simon Laplace (LMD/IPSL))