

Preface

The XIX Edoardo Amaldi Conference—*International Cooperation for Enhancing Nuclear Safety, Security, Safeguards and Non-proliferation*—was held in Rome, Italy, during 30–31 March 2015, organized by the Accademia Nazionale dei Lincei and the European Commission—Directorate-General Joint Research Centre, under the patronage of the Italian Ministry of Foreign Affairs and the support of the European Commission—Directorate-General for International Cooperation and Development. For more details, see Appendix: Program of the XIX Edoardo Amaldi Conference.

Nuclear Safety, Security and Safeguards (the 3S) and Non-Proliferation play a key role in the build-up and maintenance of the verification regime and the progress towards a nuclear-weapon-free world. This is of particular significance this year, since 2015 marks the 70th anniversary of the first nuclear-weapon test (Trinity, 16 July 1945) and the destruction of Hiroshima and Nagasaki (6 and 9 August 1945). Also, four years have passed after the Fukushima Nuclear Power Plant accident and its environmental consequences, and an important rethinking of the ways civil nuclear energy can be still exploited is underway.

In the spirit of Amaldi's intuition, the Conference was proposed as a forum where eminent scientists, diplomats and policy makers could compare national perspectives and update international collaborations, while discussing how *Science beyond Boundaries* may enhance nuclear non-proliferation policies.

A total of 30 plenary speeches have been presented by lecturers from international organizations: European Commission, International Atomic Energy Agency, Comprehensive Nuclear-Test-Ban Treaty Organization, Pugwash Conferences on Sciences and World Affairs, and from 14 countries: Argentina, Belgium, China, Finland, France, Germany, India, Iran, Israel, Italy, Japan, Pakistan, Russia, United States of America.

Talks have illustrated the political, institutional and legal dimension of the nuclear 3S, of the Non-Proliferation Regulation Systems, of the Nuclear Test Ban Treaty and have addressed the current challenges by attempting to identify possible solutions and future improvements.

The role of international cooperation and of the scientific community actions have been considered, in connection with the effectiveness in the implementation of international controls in critical areas, on technology foresight and the ongoing evaluation of current capabilities.

Several contributions have underlined the need that national procedures be implemented under the supervision of international organizations, well represented in this Conference. The role of the international organizations should increasingly be focused on promoting cooperation *beyond boundaries*, as presented in a case study in which the scientific community has demonstrated how science can overcome the absence of political and diplomatic relations in critical areas. Better synergies between international organizations and academies have been advocated, finalized to a greater involvement of the scientific community to identify the best implementation processes inherent in nuclear 3S and Non-Proliferation, to the training of future generations and the development of new strategies for the global security.

The Conference stressed that global security is a common fundamental target for scientists, diplomats and policy makers and, in the context offered by the Accademia Nazionale dei Lincei, the participants have been able to compare different experiences and discuss future strategies for an effective international cooperation, along the lines advocated long ago by Edoardo Amaldi.

Two discussion panels concluded the Conference:

- Panel I: Scientific and technical challenges to the effective implementation of the scientific and technical challenges to the effective implementation of the 3S (Safety, Security and Safeguards) approach.
- Panel II: Role of international cooperation and scientific community actions for enhancing nuclear safety, security, safeguards and non-proliferation.

In the introductions by the panellists and the ensuing discussions from the floor, the urgency of a visible progress of the Non-Proliferation Treaty and of a constructive discussion among the different actors on the nuclear scene has clearly emerged.

Positive indications were given and auspices were made concerning the conclusion of the multilateral discussion on the Iran nuclear program, ongoing in Lausanne on the same days as the Conference. They were interpreted as good omens for the signature of a positive agreement, which was in effect announced two days after the conclusion of our works.

Plans for the future include continuation of the biannual Amaldi Conferences and, possibly, an open forum, in alternate years, to stimulate further analysis on Nuclear Safety, Security, Safeguards, as well as non-proliferation studies and applications towards a nuclear-weapon-free world.

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