



International Radiation Protection Association

IRPA Executive Council Meeting, Orlando, July 2019

5.a Sievert Award Committee report

The Sievert Award Committee, chaired by the IRPA Vice-President, was comprised by the following nominated members: Renate Czarwinsky (Past-President, German-Swiss Society), Ken R. Kase (previous Past-President, Health Physics Society), Alfred Hefner (Executive Council member, Austrian society), Thiagan Pather (South African Society); Jaiki Lee (Korean Society) and John Boice (last Sievert awardee).

The letters to the AS inviting to nominate candidates were sent in September 2017. The deadline was 11 May 2018.

- Seven nominations were received (alphabetically):
 - Dudley Goodhead (nominated by the UK society)
 - Carl-Magnus Larsson (nominated by the Australasian society)
 - Jacques Lochard (nominated by the French society)
 - Ohtsura Niwa (nominated by the Nordic society)
 - Rolf Michel (nominated by the German-Swiss society)
 - Maria Perez (nominated by the Argentinean society)
 - Eliseo Vañó (nominated by the Spanish society)

The nominees short CVs are included as Annex 1. The complete CVs and the endorsement letters provided with some nominations are available if requested.

The Committee has completed the assessment process (which by the way has been not easy!), according to the Rules (see Annex 2). Each member of the Committee provided a ballot placing the candidates in rank order, with the results displayed in the following tables (note that the candidate's identities will be revealed in the EC meeting):

Ranking by Committee members

	Candidate A	Candidate B	Candidate C	Candidate D	Candidate E	Candidate F	Candidate G
Member a	7	3	4	5	2	1	6
Member b	7	5	2	4	1	3	6
Member c	1	3	2	5	4	7	6
Member d	2	4	5	1	7	3	6
Member e	5	4	3	2	7	1	6
Member f	4	5	1	2	7	3	6
Member g	7	5	4	2	3	1	6
	33	29	21 2nd	21 2nd	31	19 1st	42

Outranking table - number of times the candidate at the left of the row outranks the candidate at the top of the column

	Candidate A	Candidate B	Candidate C	Candidate D	Candidate E	Candidate F	Candidate G		
Candidate A	*	3	2	1	4	2	4	16	
Candidate B	4	*	2	2	4	1	7	20	
Candidate C	5	5	*	4	4	3	7	28	2nd
Candidate D	6	5	3	*	4	3	7	28	2nd
Candidate E	3	3	3	2	*	2	4	17	
Candidate F	5	6	4	4	5	*	6	30	1st
Candidate G	3	0	0	0	3	1	*	7	
	26	19	12	12	20	10	31		

	Candidate A	Candidate B	Candidate C	Candidate D	Candidate E	Candidate F	Candidate G
Number 1st	1		1	1	1	3	
Number 2nd	1		2	3	1		
Number 3rd		2	1		1	3	
Number 4th	1	2	2	1	1		
Number 5th	1	3	1	2			
Number 6th							7
Number 7th	3				3	1	

Top 2 candidates are:

Candidate F	
Candidate D	

In accordance with the IRPA Rules, Candidates F and D are therefore forwarded to the IRPA EC for a final decision on the Award.

Annex 1 – CVs of the nominees

Annex 2 – IRPA rules: PROCEDURE TO BE FOLLOWED IN ADMINISTRATING THE ROLF M. SIEVERT AWARD

NOMINATION FROM THE SRP (UK) FOR THE IRPA 2020 SIEVERT AWARD

PROFESSOR DUDLEY T. GOODHEAD OBE, SUMMARY CV

Professor Dudley Goodhead was born and educated in South Africa gaining his D.Phil. in particle physics at the University of Oxford (UK) in 1965. He then took academic positions at the University of California (Los Angeles), St Bartholomew's Hospital (London) and the University of Natal (Durban, South Africa).

In 1975 he joined the MRC Radiobiology Unit at Harwell, which studied the relationship between genome stability and human health, including DNA damage by radiation and other agents, and cellular repair systems. He was appointed as Emeritus Director in 2003 and continues in this role as a visiting scientist. He also assists the EC research programme as well as several agencies in the USA and UK.

He has served on a variety of national and international committees on the evaluation of radiation risks. These have included BEIR-VI, radon-risk assessment in the USA, consultancies to UNSCEAR and IAEA, Working Groups of the IARC on carcinogenic risk of gamma rays, neutrons and internally-deposited radionuclides, and the Royal Society (UK) on risks from depleted uranium. He was a founding member of the UK COMARE and subsequently Chair of CERRIE, steering to completion its report (2001-04). This committee included opposing views on the risks of internal emitters but worked through the evidence and arrived at a consensus. This was a challenging remit but the CERRIE report did much to appease the debate while crystalizing the reasons for disagreement.

Professor Goodhead's involvement with the EURATOM Treaty radiation protection programme started in the 1980s and continues to the present. He served as the Technical Secretariat to produce the high-level expert group report on European low-dose risk research (2009), which set the foundations for the future of low-dose research throughout Europe, identifying the priorities for radiation protection research and the need to consolidate European research competence.

His research interests in radiation quality led him to chair various NASA reviews on research from 2007, and to be Scientific Director (2013 to 2016) of the NASA Space Radiation Summer School at Brookhaven National Laboratory, to help scientists to develop their skills in this area. He was co-chair of the NCRP committee that wrote a commentary on radiation protection in deep space (2014).

In June 2002 Professor Goodhead was appointed an OBE by the Queen for services to medical research. Other awards recognising his outstanding contribution to RP include the Weiss Medal (UK), Failla Medal (RRS, USA), Douglas Lea Lecturer (IPEM, UK), Bacq and Alexander Award (ESRB), Honorary Fellowship of SRP(UK), Warren K Sinclair Lecturer (NCRP, USA) and the Gray Medal (ICRU).

Professor Goodhead has published over 260 research articles. A recent publication was on the survival parameters and linear energy transfer in cells following carbon-ion radiotherapy (*Journal of Radiation Research*, 2016) and he contributed to "A restatement of the natural science evidence base concerning the health effects of low-level ionizing radiation", an open access paper of the *Royal Society Proceedings B* (September 2017).

Curriculum Vitae

Carl-Magnus Larsson

Office Address: Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 38-40 Urunga Parade, Miranda NSW 2228, AUSTRALIA

PO Box 655, Miranda NSW 1490, AUSTRALIA

Email: carl-magnus.larsson@arpansa.gov.au

Office phone: +61 2 9541 8300

May 2018

Summary of career

During my career, I have spent 20 years in academia and 25 years in regulation and regulatory science (to date). My academic career commenced in the 1970's at Stockholm University. While there, I led a research group focused on the biochemistry and physiology of assimilation of nitrogen in plants, with financial support from the Swedish Natural Science Research Council and the Research Council for Forestry and Agriculture. During this time, I established a wide scientific network and spent time in three different European research laboratories.

Having found myself 'saturated' with academic life I made a career change in 1993, taking up a position with the Swedish Radiation Protection Authority (SSI) to work on different aspects of radioactive waste and spent fuel management. I was appointed Head of the Department of Waste Management and Environmental Protection in 1996 and continued in various senior positions with SSI and its successor, the Swedish Radiation Safety Authority, until 2010.

The radiation protection legislation in Sweden specifically mandates protection of the environment from the harmful effects of radiation. This led to the EU FASSET and ERICA projects between 2000 and 2007, during which I coordinated a research programme involving 15 organisations in seven countries. The final outputs, the *ERICA Integrated Approach* and the *ERICA Tool* (a software tool supporting assessments and decision-making) are to this date considered state-of-the-art. The ERICA Project was named one of the EU 6th Framework Programme's 'Success Stories'.

At about the same time ICRP initiated Committee 5, which developed the theory behind application of the radiological protection principles to protection of the environment, introduced in the ICRP system for radiological protection through *Publication 103*. I participated in the work of the Committee for 10 years as Vice-Chair and Chair, during which time *Publications 108, 114, 124 and 136* were drafted (one more draft to be released). I continue to work on these issues as an ICRP Main Commission member (since 2013). I am also engaged in ICRP finances and outreach, and in Task Groups on waste management and an integrated system for protection of people and the environment.

In March 2010, I was appointed as the CEO of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) following an international recruitment exercise. In this position, my colleagues and I have successfully implemented the ICRP and IAEA frameworks for radiological protection in the multi-jurisdictional Australian environment through, e.g., the *Fundamentals for Protection Against Ionising Radiation* (RPS F-1), the *Planned Exposure Code* (RPS C-1), the *Existing Exposure Guide* (RPS G-2) and the *Emergency Exposure Guide* (draft RPS G-3 undergoing public consultation).

I had the privilege to represent both Sweden and Australia in UNSCEAR, and to be the Chair of the Committee during its evaluation of exposures and health implications following the 2011 nuclear accident in Japan (the 2013 Report to the UN General Assembly). I participated in numerous outreach meetings in Japan to present UNSCEAR's evaluations to Cabinet, the Fukushima Prefecture, local governments and the public.

I continue to use my international experience, including my membership in ICRP and in the IAEA Commission on Safety Standards (CSS), to promote a proportionate and integrated system for radiological protection of people and the environment. Through this and in international collaboration, I work towards a review of the Safety Fundamentals to take into account the 2012 UNSCEAR report to the General Assembly on attribution of health effects and inference of risk, and to work with ICRP colleagues and all stakeholders towards the next generation of general Recommendations on Radiological Protection.

May 2018

Positions held

March 2010 - present	Chief Executive Officer, Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).
January 2009 – March 2010	Head, Department of Radioactive Materials, Swedish Radiation Safety Authority, SSM.
July 2008 – December 2008	Head, Department of Radiation Protection, SSM.
March – June 2008	Acting Director General, Swedish Radiation Protection Authority (SSI).
April 2006 – February 2008	Head, Department of Emergency Preparedness and Environmental Assessment, SSI.
2003 – 2008	Deputy Director General, SSI.
1996 – 2006	Head, Department of Waste Management and Environmental Protection, SSI.
1996	Project Manager, National Chemicals Inspectorate of Sweden.
1993 – 1996	Project manager, SSI, specialising in public health and environmental issues in relation to Swedish nuclear power and RW/SF management.
1980 – 1993	Research Assistant, Senior Lecturer/Associate Professor, Acting Professor and Head of Department, Stockholm University.
1974 – 1975	On leave from Stockholm University for National Service (Royal Coastal Artillery Defence of Gotland).
1973 – 1980	Teaching assistant, recipient of grants for PhD studies while completing PhD-thesis and exam.

Educational background

1984	Associate Professor/Senior Lecturer ('Docent'), Physiological Botany, Stockholm University.
1980	PhD, Botany, Stockholm University. Thesis: Photophosphorylation in <i>Scenedesmus in vivo</i> : Phosphate binding and dynamics of adenine nucleotide pools in relation to electron transport pattern.
1974 – 1975	On leave for National Service.
1970 – 1974	BSc, MSc: Chemistry (general), Biology (general), Zoology, Botany, Ecology, Stockholm University.
1970	Graduated from High School ('Gymnasium'), Gångsätra Skola, Lidingö, Sweden, Natural Science Programme.

Scientific collaboration and activities

UNSCEAR	Representative of Sweden to the United Nations Committee on the Effects of Atomic Radiation 2009 – 2010, Australia’s Representative 2010 – 2015. Vice-chair of the Committee 2011 – 2012, Chair 2012 – 2015 and member of the Bureau as <i>ex officio</i> adviser 2015 – 2016. As Chair, I oversaw the finalisation of the 2012 Report to the UN General Assembly (on attributability of health effects and inference of risks; and on uncertainty in cancer risk estimates) and the 2013 Report (on exposures and risks from the 2011 nuclear accident in Japan; and on cancer risks from childhood exposure to radiation). Multiple outreach missions to Japan to communicate UNSCEAR’s findings in relation to the 2011 nuclear accident to Ministers and Cabinet; Fukushima Prefecture administration; municipality administrations; and the general public.
International Projects	Coordinator for the multi-national projects FASSET (Framework for assessment of environmental impact, 2000 – 2003) and ERICA (Environmental Risks from Ionising Contaminants Assessment and management, 2004 – 2007), of the EU’s 5th and 6th Framework Programmes, respectively. The projects involved 15 organisations in 7 European countries, with a total of 60 scientists plus experts from over 50 organisations assembled into an ‘End-User Group’. The major scientific findings of the FASSET Project have been published in a Special Issue of Journal of Radiological Protection (Vol 24:4A, 2004); those of the ERICA Project were published in a Special Issue of Journal of Environmental Radioactivity (Vol 99:9, 2008). Full documentation on these projects can be found on http://www.ceh.ac.uk/PROTECT/ .
International Conferences	Member of numerous scientific and/or organisational committees for scientific symposia in Radiation Protection, <i>inter alia</i> the three international conferences on environmental radiation protection (Stockholm 1996, Ottawa 1999, Darwin 2002), IAEA’s Conference on Environmental Protection in Stockholm, 2003, and ECORAD 2001, 2004 and 2008. Member of the International Programme Committee for IRPA 13 in Glasgow 2012. Collaborating with the Australasian Radiation Protection Association (ARPS) in the local organisation of ICRP 2019 in Adelaide. Chaired the IAEA International Conference on Safety of Radioactive Waste Management in 2016. Chaired the Competent Authorities’ Meeting under the Early Notification and Assistance Conventions, 2016.
International research visits	Visiting scientist at: <ul style="list-style-type: none"> • Technische Hochschule, Darmstadt, Germany, 1981 – 1982; • Universidad de Sevilla, Spain, 1983 – 1985; and • Long Ashton Research Station, UK, 1987 – 1988.
Scientific publications	See separate publication list.

Contribution to the international framework for radiation and nuclear safety

ICRP	<p>Participated in the Task Group that co-authored <i>Publication 91</i> of the International Commission on Radiological Protection (ICRP), which became the foundation publication for Committee 5 (on environmental protection), established in 2005. Vice-chair of Committee 5 2005 – 2013, Chair 2013 – 2015. Member of the ICRP Main Commission since 2013.</p> <p>Co-authored <i>Publications 108, 122 and 124</i>. Member of Task Groups 97 (near surface disposal facilities), 99 (reference animals and plants) and leading 104 (integrated system for protection of people and the environment).</p>
IAEA	<p>Representative of Sweden in the Commission on Safety Standards (CSS) 2008 – 2010; Representative of Australia from 2010 – present.</p> <p>Numerous consultancies with the IAEA, <i>inter alia</i> for revision of the General Safety Requirements (GSR Part 1); <i>Governmental, Legal and Regulatory Framework for Safety</i>.</p> <p>Subject matter (radioactive waste and spent fuel management) in the Integrated Regulatory Review Service (IRRS) missions to:</p> <ul style="list-style-type: none"> • France (primary mission in 2006, follow-up in 2009); and • Spain (primary mission 2008, follow-up in 2011). <p>Deputy Team Leader for the missions to</p> <ul style="list-style-type: none"> • Japan (primary mission in 2016); and • Spain (mission to take place Oct 2018). <p>Team Leader for the missions to:</p> <ul style="list-style-type: none"> • United Arab Emirates (Primary Mission in 2011, follow-up in 2015) • Indonesia (Primary Mission in 2015). <p>Peer review of the US DoE biosphere modelling programme for the Yucca Mountain Project (2000).</p>
OECD Nuclear Energy Agency	<p>One of the original founders of the Regulators' Forum of the Radioactive Waste Management Committee OECD/NEA, Vice-Chair 2002-2004 and Chairman 2004 – 2006.</p> <p>Member of the Radioactive Waste Management Committee (RWMC) of the OECD/NEA 1996 – 2006 and 2008 - 2010. Member of the Committee on Radiation Protection and Public Health (CRPPH) 2006 – 2008.</p> <p>Chaired the Long-Term Safety Criteria initiative, launched in 2004 and published in 2007, NEA No.6182.</p>
International aid projects	<p>Project leader for the project <i>Strengthening the Radiation Protection System in Cuba</i> 2000 – 2003, funded by the Swedish International Development Cooperation Agency, covering radiation protection in medicine, radioactive waste management, natural radiation and emergency preparedness.</p>
European Union	<p>Member of the Group of Experts under the terms of Article 31 of the Euratom Treaty, 2008 – 2010. Previously member of the Group of Experts established under Articles 36 and 37 of the Treaty.</p>

Other (selected) activities relevant to radiation safety

- Head of the Australian Delegation to the Second Ministerial Conference on Nuclear Safety in Koriyama 2012, Head of the Australian Delegation to the Convention of Nuclear Safety in 2011, member of the Australian Delegation to the IAEA General Conference 2010 – 2017.
- Statutory member under the *Australian Radiation Protection and Nuclear Safety Act 1998* of the:
 - Radiation Health and Safety Advisory Council (members appointed by the Minister);
 - Nuclear Safety Committee (members appointed by the CEO of ARPANSA); and
 - Radiation Health Committee (members nominated by States and Territories, appointed by the CEO of ARPANSA).
- Expert to the investigation on coherent national legislation in the areas of nuclear safety and radiation protection (M 2008:05), Office of the Swedish Government, 2009 – 2010.
- Chairman of the 'Council for Radioactive Waste and Spent Nuclear Fuel', an advisory body to the SSM with external members, 2009 – 2010.
- Member of the Board of the Centre for Radiation Protection Research, Stockholm University, 2008 – 2010.
- Member of the Steering Committee of the Centre for Disaster Medicine at the National Board of Health and Welfare (Sweden), 2007 – 2010.
- Head of the Nuclear and Radiological Emergency Organisation at SSI/SSM, responsible for issuing and co-ordinating advice and measurements on a national level in the event of an emergency.
- Vice-chair of the Working Party on Radioactive Substances (now Radioactive Substances Committee) of the OSPAR Convention for the protection of the marine environment of the North-East Atlantic.



Jacques LOCHARD's APPLICATION FILE FOR THE 2020 SIEVERT AWARD

OUTLINE OF Jacques LOCHARD's CONTRIBUTION TO RADIOLOGICAL PROTECTION

For more than three decades he left his mark on the French and international radiological protection scene as much through his theoretical, methodological and practical contributions as his unreserved commitment to the service of radiation protection professionals and other stakeholders.

He has undeniably helped to open up radiological protection to the social sciences. His contribution to formalise and explicit the economic and societal considerations in the implementation of the optimization principle and for the protection of people in post-accident nuclear situations are widely recognized. His active participation in the work of the CRPPH and the ICRP has contributed to the recent evolution of the radiological protection system towards more openness and inclusiveness, as well as clarifying its ethical foundations.

Jacques Lochard has also worked throughout his career at the service of radiation protection professionals. He put his managerial skills at the service of the radiation protection professionals both at the national level within the SFRP and at the international level within the IRPA. As President of SFRP he has modernized and energized the society and as Executive Officer of IRPA he has worked tirelessly with the successive presidents to reinforce the international role of the Association.

As much for his scientific contribution as for his input to the protection of workers and the public in the fields in which he exercised his expertise, Jacques Lochard deserves to be a candidate to receive the Sievert Award.

***The members of the Administration Board of the
French Society for Radiation Protection***

CURRICULUM VITAE OF Jacques LOCHARD

Date of birth: 19 May 1950
Place of birth: Montbéliard, France
Address: 7 avenue Gallieni, 92160 Antony, France
E-mail: jlochard@gmx.fr
Telephone: +33 6 88 70 22 30

Educational background:

- Junior high school: Lycée Cuvier, Montbéliard, France, 1961-1968. Graduated in Natural Sciences in 1968
- Bachelor of Science in Economics, University of Besançon, France, June 1970
- Master of Science in Economics, University of Besançon, France, June 1972
- Master of Advanced Studies in Economics, University Paris-Panthéon-Sorbonne, Paris, France, March 1974

Occupation and positions held from 1975 to present:

- Teacher of law and economics at the Champigny-sur-Marne high school, France, from September 1975 to August 1976
- Teacher of law and economics at the Saint-Maur-des-Fossés high school, France from September 1976 – to August 1977
- Researcher at the Nuclear Protection Evaluation Centre (CEPN), France, from September 1977 to December 1982
- Senior researcher at CEPN from January 1983 to June 1986
- Project leader at CEPN from July 1986 to February 1989
- Director of CEPN from March 1989 to December 2016
- Professor at Nagasaki University, Japan, from January 2017 to present
- Visiting Professor at Hiroshima University, Japan, from January 2017 to present

Main national and international professional responsibilities:

- President of the French Society for Radiation Protection - SFRP (1997-1999)
- President of the "History Club" from SFRP (2005-2010)
- Executive Officer of IRPA (2000-2012)
- Chairman of the CRPPH/NEA (2005-2009)
- Chairman of the Commission on long term recovery of the 'Steering Committee for the Management of the Post-accident Phase of a Nuclear Accident' - CODIRPA (2009-2012)
- Secretary of Committee 3 of the International Commission on Radiological Protection-ICRP (1994-1997)
- President of ICRP Committee 4 (2009-2013)
- Vice-Chair of the Main Commission of ICRP (2013 to present)

Main international project responsibilities:

- Coordinator of the EC-CIS Joint Study Project on 'Development and Application of Techniques to assist in the Establishment of Intervention Levels for the Introduction of Countermeasures in the Event of an Accident' (1992-1996)
- Coordinator of the European ETHOS Project on the 'Rehabilitation of living conditions in the contaminated territories by the Chernobyl accident in Belarus' – European Research Programme on Radiation Protection (1996-2001)
- Member of the Management Committee of the European EURANOS project on 'Emergency and Recovery Preparedness and Management', coordinator of the work packages on recovery preparedness and management after a nuclear accident – European Research Programme on Radiation Protection (2004-2008)
- Coordinator of radiological quality priority area of the International CORE Program on 'The rehabilitation of living conditions in contaminated areas of Belarus' (2004-2008)

Professional Awards

- Professor Shinji Takahashi Memorial Lecture, Japan, 2014
- Thomas S. Tenforde Lecture, USA, 2015

Publications and communications:

- More than 80 reports and 100 articles alone or in collaboration and more than 300 oral presentations in congresses, conferences, workshops, technical meetings (see lists in Annex)
- A book 'on the history of radiological protection: 'La robe et le nuage'. Lochard J., Tabare M., Néo éditions, 2013, 128p

Scientific exhibition:

- Curator of the exhibition 'Did you say Radiation Protection? Stories of X-rays, radioactivity...' presented in Montbéliard, France, 2007, Valence, France, 2008, Buenos Aires, Argentina, 2008, Paris, France, 2009, Lausanne, Switzerland, 2010, Helsinki Finland, 2010, Chambéry, France, 2011, Nantes, France, 2011, Paris, France, 2013

Participation in documentary films

- 'Pouvons-nous vivre ici?', Film of Sylvaine Dampierre, Quark Productions, 57', 2002
- 'Tchernobyl Fukushima: vivre avec', Film of Olivier Julien, 1h27', Bellota films, Quark Productions, 2016

MAIN CONTRIBUTIONS OF Jacques LOCHARD TO RADIOLOGICAL PROTECTION

As researcher and director of the CEPN

An economist by training, Jacques Lochard began his career in radiological protection as a researcher in 1977 at the Nuclear Protection Evaluation Centre (CEPN) a non-profit association newly created to develop research and studies on the technical, health, economic and social aspects of radiological protection in the nuclear field. His early work focused on **decision-aiding techniques for implementing the optimization principle** and particularly the **cost-benefit model** recommended by ICRP Publication 26 just issued.

During the eighties, he first applied these decision-aiding techniques for the evaluation and selection of treatment systems for radioactive effluents from nuclear installations for the **protection of the public**. On this occasion he became familiar with the modelling of transfers of radionuclides in the environment and the evaluation of the doses to the public.

At the request of the French operators, he then devoted his expertise to the practical implementation of the optimization principle for **the protection of workers** in nuclear installations. For almost a decade he was involved in many studies to improve the protection of workers during the maintenance of nuclear reactors. He also contributed to the development of methodologies for the application of the optimization principle in the design of nuclear installations. On the occasion of these studies, he developed a methodology based on an **analytical approach to occupational exposures**, resulting in the development of the **first software for estimating, monitoring and analysing the doses of workers during the major maintenance operations at French nuclear reactors**. He visited many nuclear power plants abroad to identify good practices in the field of workers' protection and participated in numerous field studies in France, particularly in relation to the changes of steam generators in nuclear power plants.

During the eighties Jacques Lochard took an active role in the development of the **special cooperation between CEPN and the former NRPB** (National Radiological Protection Board in UK) that played a key role in developing the principle of optimization in European countries through a series of **research studies, workshops and training courses** of which the two organizations were the pillars. In this context he has published numerous articles on methodological and practical aspects of the optimization principle in collaboration with his French and UK colleagues. It is in the continuity of these activities that he launched the idea of the **European ALARA network**, which was the first professional network in Europe in the field of radiation protection.

In parallel with his work on the optimisation of protection for public and workers, Jacques Lochard contributed to the **evaluation of the external costs of the nuclear fuel cycle** within the framework of the European Research Program 'EXTERNE', which mobilized numerous teams specialized in **risk assessment and risk management** in Europe. Following this work, he had the opportunity to contribute to several international expert groups devoted to the **comparison of the health and environmental risks of the different energy systems** for the production of electricity.

The year 1990 was a turning point in his career. At the request of the European Commission he participated as an expert to the Chernobyl Project led by the IAEA **to assess the health, environmental and social consequences of the Chernobyl accident in the Soviet Union**. In this context he realized with his colleague Thierry Schneider a cost-benefit study to assess

the relevance of relocating the populations of the Republics of Belarus, Russia and Ukraine living on the edge of the 30 km exclusion zone set up by the authorities. On this occasion he discovered the **psychological and social consequences** for the populations affected by the accident and from there devoted an essential part of his research activities but also his field practice to the **protection of people in contaminated territories after a nuclear accident**.

Following the Chernobyl project, in parallel with his responsibilities as new director of the CEPN, he participated actively in the establishment and implementation of **research programs and field works in the Commonwealth of Independent States**. Altogether he spent more than 14 months in villages in the contaminated areas of Belarus between 1996 and 2008. During these years he contributed to the development of methodologies to implement the optimisation principle in post-nuclear accident exposure situations based on the **involvement of stakeholders** (the so called **co-expertise process**) and the empowerment of affected people to acquire the **practical radiation protection culture** necessary to regain their autonomy and dignity. He also played a key role in structuring recovery research after a nuclear accident. He has published many articles in this field and was co-founder with Wolfgang Raskob of the European Platform on Preparedness for Nuclear and Radiological Emergency Response and Recovery – NERIS (2010) which became the model for the various platforms that now structure the radiological protection research community in Europe

A few months after the accident in Fukushima in March 2011 Jacques Lochard was asked by Japanese officials and experts **to share his experience** gained in Chernobyl. In close cooperation with colleagues from the ICRP he initiated a series of **Dialogue meetings in the Fukushima Prefecture** with the objective of directly involving the affected population and other stakeholders to address the challenges of the long-term rehabilitation of the living conditions in the affected territories. He acted as facilitator of 19 dialogues meetings up to now, which played a considerable role to help affected populations to regain their autonomy. In parallel, he participated in numerous scientific and technical meetings on the health, environmental and social consequences of the accident during which he had the opportunity to share his experience in post-accident management.

Throughout his career Jacques Lochard worked as an **expert for many organizations involved in radiological protection in France and internationally**. In France he was inter alia a member of the Energy-Risk-Environment-Health Working Group of the Plan Commission (1997-2002), a member of the Radiological Protection Section of the Higher Council of Public Hygiene of France (1997-2002), and the chairman of the Commission on long term recovery of the 'Steering Committee for the Management of the Post-accident Phase of a Nuclear Accident' - CODIRPA (2009-2012). At the international level he participated as experts in several working groups and technical committees of the IAEA, UNDP and the European Commission. For the later he was member of the management Committee of the research project on the Real Time Online Decision Support System (RODOS) for **nuclear emergency management** from 1990 to 1998.

A final point to mention is the fact that Jacques Lochard has never lost sight of his initial professional commitment as a teacher. Throughout his CEPN career he has been involved as an educator or trainer for future or young professionals in radiological protection and gave dozens of **courses on the theoretical and practical aspects of radiological protection**. He has lectured in many universities and engineering schools (Paris, Grenoble, Nice, Strasbourg) and also intervened in many training courses in France but also abroad especially in the framework of European programs.



As a professor at Nagasaki University and Hiroshima University

Jacques Lochard's experience in Chernobyl and his involvement in Japan prompted him to be asked at the end of 2016 by the Japanese academic world to participate in the education and training of future professionals and experts in charge of the recovery process in Fukushima and in case of possible future accident in Japan or in Asian countries. It is in this context that Jacques Lochard ended his long career at CEPN, and accepted the positions of full time Professor at Nagasaki University and visiting Professor at Hiroshima University.

At Nagasaki he is in charge of the Department of Health Risk Control of the Atomic Bomb Disease Institute where he leads research on the **human dimensions** of nuclear post-accident situations, the implementation of **protective actions** in contaminated areas after a nuclear accident and the **process of co-expertise** for rehabilitating living conditions of people affected by a nuclear accident. He is also responsible of 3 courses in the Joint Nagasaki University and Fukushima Medical University Graduate School on Disaster and Radiation Health Sciences (Master's degree): **radiological protection, radiation risk communication and advanced radiation risk management**.

At Hiroshima University he is regularly invited to give lectures on **radiological protection and the management of post-accident recovery** in the Phœnix Leader Education Program (Hiroshima Initiative) for Renaissance from Radiation Disaster, which was created after the Fukushima accident as a Leading Graduate School supported by the Ministry of Education, Culture, Sport, Science and Technology (MEXT).

As member of the French Society for Radiation Protection (SFRP)

Jacques Lochard joined the French Society of Radioprotection as early as 1982, in which he held almost all the functions: from a **member** involved in the organization of meetings to that of **President of the Society** through that of **member of the Editorial board** of the 'Radioprotection' journal and **secretary of the Society** and then later **president of the History Club** and more recently a **member of the International Relations Committee**.

As President his main action was the **opening of the Society to the radiological protection professionals** for until then only engineers and doctors in science and medicine had been admitted as members. He also created the '**History club**' and the '**Young professional club**' who have become models for many radiation protection societies. He was also at the origin of the initiative of the holding of a **National Congress** every two years and the creation of the first **SFRP website**.

As member of IRPA

Jacques Lochard was elected at the IRPA Executive Council in 1992 at the occasion of the IRPA 8 General Assembly in Montreal, Canada. He first served IRPA as a simple Council member under the chairmanship of Charlie Meinhold (USA) and then Klaus Dufts Schmid (Austria). He became the Executive Officer at IRPA 10 in Hiroshima (2000) under the chairmanship of Geoffrey Webb (UK). He served in this position two more terms until 2012 under the chairmanship of Phil Metcalf (South Africa) and finally Kenneth Kase (USA).

During his twenty years in the IRPA Executive Council Jacques Lochard has made a significant contribution to the consolidation and modernization of the Association. In collaboration with the successive presidents he served as Executive Officer, he developed, among other things, the first IRPA **website**, set up the **regional congresses** and the **Associate Societies Forum**,



contributed to the development of the **IRPA Code of Ethics** and the revision of the **Constitution and the Rules**. He also launched the idea of the series of **Guiding Principles for Radiation Protection Professionals**. He organized and animated the series of workshops held in Spain, France and UK with the support of Associate Societies and the consultations at Regional Congresses in France, Mexico, China, Egypt and Romania that resulted in the adoption of the Guiding Principles on Stakeholder Involvement. This first experience of involvement of the IRPA professionals worldwide undoubtedly marked a turning point in the operation of the Association.

As member of NEA-CRPPH

During the beginning of nineties Jacques Lochard contributed regularly to working groups of the Committee on Radiological Protection and Public Health of the Nuclear Energy Agency (CRPPH). His first participation was in the context of the development of a CRPPH report on the **concept of dose constraint** newly introduced by ICRP Publication 60. He also participated as consultant to internal meetings of the CRPPH secretariat to share his experience with the protection of workers in French nuclear power plants. It is in this context that he suggested to NEA secretariat, Oswaldo Ilari and Christer Viktorsson, the idea to develop an **international data base on occupational exposure** to stimulate the optimisation of protection of workers at nuclear power plants.

The **International System on Occupational Exposure (ISOE)** was officially launch in 1992 the year Jacques Lochard became a member of CRPPH. In the late nineties he initiated with Serge Prêtre, who was the chair of the Committee, a series of 3 workshops on **'Stakeholder participation in radiological decision making'** held in Villigen, Switzerland. These workshops greatly influenced the ICRP's decision to include stakeholder involvement in the 2007 ICRP general recommendations. As chair of the Committee Jacques Lochard initiated a new series of workshops on **'Science and Values'** to which he actively contributed and which formed the basis of the future developments on the **ethics of radiological protection**.

As member of ICRP

Jacques Lochard joined ICRP Committee 3 on the protection in medicine in 1993. As secretary of the Committee he contributed to the development of ICRP Publication 73 (1996) on 'Radiological protection and safety in medicine'. He took the initiative to translate this Publication in French with the help of a group of medical doctors members of SFRP.

In July 1997 he became member of ICRP Committee 4 on the application of the recommendations. He participated to the Task Group, which developed ICRP Publication 101b (2006) on 'The optimisation of radiological protection- Broadening the Process' (2006). He then chaired the Task Group, which developed **ICRP Publication 111 (2009)** on the 'Application of the Commission's recommendations to the protection of people living in long-term contaminated areas after a nuclear accident or a radiation emergency'. This publication, which benefited largely of his Chernobyl experience introduced the concepts of **'practical radiological protection culture'** and **'self-help protection'** that emerged in the contexts of the projects he implemented in Belarus during the late nineties.

As Chairman of Committee 4 from 2009 to 2013, he initiated a programme of work on **existing exposure situations** and the **ethics of radiological protection**. During this period he co-chaired with Ian Pentreath the Task Group that developed ICRP Publication 124 (2014) on the 'Protection of the environment under different exposure situations' and he chaired the Task Group, which developed **ICRP Publication 132** (2016) on the 'protection from cosmic radiation in aviation'.



More recently, as vice-chair of the Main Commission, he contributed significantly to **ICRP Publication 138 (2018)** on the 'Ethical foundations of the system of radiological protection' based on his contribution for the **Thomas S. Tenforde Lecture** he presented at the 2015 NCRP Annual meeting. This Publication also benefited from the contributions of **a series of international workshops co-organized by ICRP and IRPA** at his initiative. Currently he is involved in the development of the Task Group on the 'Application of the Commission's recommendations for the protection of people and the environment in the event of a large nuclear accident', which will update ICRP Publications 109 and 111, drawing the lessons from the management of the Fukushima accident.

Curriculum vitae



Ohtsura Niwa, PhD

Career summary (493 words)

Ohtsura Niwa is an Emeritus Professor of Kyoto University. Born in Kobe, Japan, he spent his early life in rural areas which intrigued his interest in living organisms. He received a B.Sc. from Kyoto University in 1967 majoring in zoology, and a Ph.D. in 1975 from Stanford University for his research on radiation induced leukaemia virus of the mouse.

He started his research career at Kyoto University in 1975, and then moved to Hiroshima University Research Institute of Radiation Biology and Medicine in 1984. He moved to Kyoto University Radiation Biology Center in 1997. After retirement from Kyoto University in 2007, he took a position of deputy director of Research Center for Charged Particle Therapy, National Institute of Radiological Sciences, Chiba and then served as a CEO of BioMedics Japan in Tokyo. He then went on to Fukushima Medical University. In 2015, he took up his current position as Director and Chairman of the Radiation Effects Research Foundation in Hiroshima.

Professor Niwa's research has centred on radiation effects on living organisms, and the subjects studied cover a wide range including: studies of endogenous mouse retrovirus involved in radiation induced mouse leukemia, including its host cell dependency (ref. 127 in his complete list of publications), suppression of the virus genome by DNA methylation (ref. 119), its activation by radiation and demethylating agent of 5-azacytidine (ref. 124, 119) and silencing in embryonal stem cells (ref. 117, 104); host cell reactivation of UV irradiated herpes simplex virus in tissue culture cells (ref. 118); indirect nature of maternal allele mutation at a minisatellite locus and the pink-eyed unstable allele in F1 mice born to radiation exposed sperm (ref. 75, 49); p53 dependency and delayed expression of above mutations (ref. 44, 38); long lasting DNA damage memory in mice and in *Schizosaccharomyces pombe*; and the mechanism of p53 dependent S checkpoint in preimplantation stage mouse embryos (ref. 27, 26, 23).

In addition to the molecular pathways of mutation induction as described above, Ohtsura Niwa took interest in the mechanism of radiation carcinogenesis while working in Hiroshima where he became acquainted with many researchers of the Radiation Effect Research Foundation. He was particularly fascinated by the age dependence of radiation carcinogenesis and as for the mechanism he is currently focusing on the role of stem cell competition in adult stem cell niche. Stem cell competition is a dynamic process to eliminate rogue stem cells in a niche and is the underlying mechanism for the age dependence and low dose rate effects (ref. 2).

Continued overleaf

The Fukushima nuclear accident taught Ohtsura Niwa the lesson that science and scientific knowledge alone are of little use for the resident living in the affected land. The most fundamental issue for science to be of any help to the people is that it is spoken by individuals to whom they trust. Merging of science and humanity is of the utmost importance in the 21st century, not only for the recovery from the Fukushima accident, but for helping people trapped in any disastrous situation.

Personal details

Name: Ohtsura Niwa
Address: 5-1 Hijiyama Park, Minami-ku, Hiroshima, 732-0815, Japan
Tel: +81-80-3101-7343 (cell phone)
+81-82-261-3131 (office)
E-mail: oniwa6@gmail.com
Nationality: Japan
Date of birth: July 16, 1943
Place of birth: Ashiya, Hyogo, Japan

Education

1975 PhD, Biophysics (Stanford University)
1969 MSc, Radiation biology (Kyoto University)
1967 BSc, Graduate, Zoology (Kyoto University)
1963 High School (Toyonaka High School, Osaka)

Professional appointments

2015-present Director and Chairman, RERF (Radiation Effects Research Foundation)
2012 Extraordinary Professor, Fukushima Medical University
2009 Director, BioMedics, Japan
2007 Deputy Director, NIRS (National Institute of Radiation Sciences)
1997 Professor, Kyoto University Radiation Biology Center
1991 Professor, Hiroshima University Dept of Molecular Biology
1984 Associate Professor, Hiroshima University Res. Inst. for Nuclear Medicine and Biology
1975 Assistant, Kyoto University Dept of Experimental Radiology
1971 Research assistant, Stanford University Medical Dept (A Radiology)

Professional activities

2009-2017 Main Commission member, ICRP (International Commission on Radiological Protection)
2013-2015 Member of the Fukushima Comprehensive Report team, IAEA (International Atomic Energy Agency)
2007-2011 Vice President and President, IARR (International Association of Radiation Research)
2002-2013 Member, Japanese expert panel for UNSCEAR (UN Scientific Committee on the Effects of Atomic Radiation)
2001-2009 Member, ICRP Committee 1
2000-2003 President, The Japanese Research Society

Recent publications

Professor Niwa has published more than 130 papers in international peer-reviewed journals, see attached list for full details. Recent papers include, e.g.,

Salomaa et al. (2017) Summary of the Bill Morgan Memorial Symposium 2: Low dose epidemiology. *Int J Radiat Biol* 93:1118-1120
Rühm et al. (2015) Dose and dose-rate effects of ionizing radiation: a discussion in the light of radiological protection. *Radiat Environ Biophys* 54: 379-401
Ohtsuru et al. (2015) Nuclear disasters and health: lessons learned, challenges, and proposals. *Lancet* 386 (9992): 489-97.

Awards

2015 Henry S Kaplan Distinguished Scientist Award, the International Congress of Radiation Research
2015 The Takashi Nagai Memorial Nagasaki Peace Award, Nagasaki, Japan
2005 Röntgen Medal, Remscheid, Germany

CURRICULUM VITAE

Prof. Dr. rer. nat. Rolf Michel

Date of birth: 21.1.1945
Studies: 1964 – 1971 Physics, University Cologne, Germany

CAREER

1971 Diploma in Physics (grade: very good)
Thesis: The element- and isotope-analysis of Rhenium in lunar material and the importance of ^{187}Re for cosmic chemistry (“Über die Element- und Isotopenanalyse von Rhenium in lunarem Material und die Bedeutung des ^{187}Re für die Kosmochemie”)

1975 Ph.D.: Dr. rer. nat. (grade: excellent)
Thesis: Neutron-induced effects on lunar surface (“Neutroneninduzierte Effekte in der Mondoberfläche“)

1980 Habilitation: Venia legendi for nuclear chemistry
Thesis: Investigation of proton-induced reactions with elements Ti, V, Mn, Fe, Co and Ni (“Untersuchungen protoneninduzierter Reaktionen an den Elementen Ti, V, Mn, Fe, Co, und Ni”).

1971 – 1984 Research Assistant, Institute for Nuclear Chemistry, University Cologne

1984 Scientific consultant PATI GmbH, Cologne

1984 Professor (C3) for Radiation Protection, member of the faculty of physics of University Hannover

Since 1996 Professor (C4) for Radiation Protection and Radioecology, University Hannover

1984 - 2010 Head of the Center for Radiation Protection of the University Hannover

2010 Retirement

2010 – 2012 Teaching assignment Leibniz University Hannover

PRACTICAL RADIATION PROTECTION:

1977 - 1984 Radiation protection officer at the Institute of Nuclear Chemistry, University Cologne

1984 - 2010 Responsible for radiation protection at the Central Institute for Radiation Protection and Radioecology, University Hannover

2000 - 2010 Responsible for radiation protection auditing at and consultant of the president, University Hannover

FIELDS OF RESEARCH

- radiation transport
- nuclear metrology and nuclear analytical methods
- production of radionuclides in nuclear reactions
- interactions of cosmic radiation with matter
- radioecology and exposure assessment
- statistical methods for uncertainty assessment
- risk perception and risk communication

Publications: About 600 publications in scientific journals, conference proceedings and international reports, various review papers and monographies (see separate list).

TEACHING

1971 - 1984	Various courses in Nuclear Chemistry
1984 - 2012	Courses for students on Nuclear Physics, Nuclear Chemistry, Radiation Protection and Radioecology, education of radiation protection professionals and specialists
1976 - 2010	Education of diploma- and Ph.D.-students

SERVICE IN SCIENTIFIC SOCIETIES AND COMMISSIONS

- ISO/TC 85/SC 2/WG 17 (previously ISO/TC 85/WG 2) „Radioactivity Measurements (since 1996), Convenor since VI/1997 until March 2004 (officially) until March 2005 (effectively)
- German Delegate to UNSCEAR 2007 - 2018
- Member of the Article 37 Group (EURATOM) 2005 - 2020
- DIN/NMP, deputy chairman AK 2.12 (Detection Limits) and Working Group SIGMA of the Fachverband für Strahlenschutz (Chairman since 2000)
- German Radiation Protection Commission (SSK) 1999 – 2006 and 2008 – 2018; 2008 – 2011 Chairman of the SSK; 2005 – 2006 and 2013 – 2014 Deputy Chairman of the SSK,
- Committee „Protective Measures in Agronomy” of the German Radiation Protection Commission (I/1997-XII/1998)
- Committee „Radioecology” of the German Radiation Protection Commission 1996 – 2001 and 2013 – 2018; 1999 – 2001 Chairman of the Committee.
- Member of various Working Groups of the SSK 1999 - 2018
- SSK Crisis Organization 2010 - 2018, 2012 – 2018 Chairman

MEMBERSHIPS

- Deutsch Schweizer Fachverband für Strahlenschutz (FS), 2008 – 2009 President
- German Chemical Society (GDCh): Division of Nuclear Chemistry (until 1993 Curatorial Board Activation Analysis, since 1993 permanent member of the board of the Nuclear Chemistry Division, 1999 - 2006 Chairman of the Nuclear Chemistry Division)
- European Physical Society
- German Physical Society, Divisions „Hadrons and Nuclei“ and „Radiation Physics and Radiation Effects“
- Meteoritical Society

HONOURS

1986	Fritz Strassmann Award of the Nuclear Chemistry Division, German Chemical Society
2002	Fellow of the Meteoritical Society
2010	Badge of Honor of the ÖVS
2011	Golden Badge of the FS
2015	Honorary Member of the German Swiss Radiological Protection Association
2015	Federal Cross of Merit of Germany

Dr. María del Rosario Pérez's abridged CV

Dr. María del Rosario Pérez is a physician who received her M.D. in 1980 from the Faculty of Medicine of the Buenos Aires University in Argentina (UBA). Dr. María Pérez has acquired a solid and extensive education and training in topics related to radiation protection that started with the career of specialist in Diagnostic Imaging and Radiotherapy (UBA), the Course of Dosimetry in Radiotherapy and her work in a Department of Radiotherapy.



Dr. María Pérez got a diploma on Radiological Protection and Nuclear Safety from the International Atomic Energy Agency (IAEA), the Atomic Energy National Commission of Argentina (CNEA) and UBA; she attended numerous specialization courses including "Diagnosis and Treatment of Radiation Victims" (CEA/INSTN/Saclay, France), stages at the Institute of Radioprotection and Nuclear Safety (IRSN, France), and scientific visits at the Immunohematology Service of the Saint Louis Hospital in Paris, France, among others. All this education and training in the different fields of health care and radiation protection have given Dr. María Pérez a solid and extensive background to develop all her professional activities.

The professional career of Dr. María Pérez has been devoted to radiation protection for almost 3 decades: 1991-1995: Dr. María Pérez was a researcher at the CNEA Biological Dosimetry Laboratory, focusing on radiation induced cancer risk, radioepidemiology, biological indicators of radiation exposure and biological risks of ionizing radiation.

1995-2007: Dr. María Pérez worked as a researcher at the National Nuclear Regulatory Body (ENREN) and the Nuclear Regulatory Authority of Argentina (ARN). She was Head of the Radiopathology Laboratory, Secretary of the ARN Advisory Council on Radiation and Radioisotopes, Head and national liaison for the WHO Radiation Emergency Medical Preparedness and Assistance Network (REMPAN), alternate representative of Argentina at the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), and consultant for UNSCEAR on effects of ionizing radiation on the immune system. She contributed to the implementation of education and training programs on radiation protection in Latin America and participated in international expert teams involved in the preparedness and response in radiation emergencies. She coordinated research projects on the effects of ionizing radiation on the immune system, fetal brain, and endothelial cells.

2007 to present: Dr. María Pérez has been working at the WHO Radiation Programme (RAD/IHE/PHE/CED). Her responsibilities at WHO include the development of guidance, norms and standards on radiation protection of patients, workers and public in planned, existing and emergency exposure situations, as well as the

provision of technical support for medical preparedness and response to radiological and nuclear emergencies. One of her main responsibilities at WHO is the technical coordination of the WHO Global Initiative on Radiation Safety in Health Care Settings, currently focused on supporting the implementation of the Bonn Call for Action. In this context, she actively collaborates with international and regional campaigns on radiation protection in health care in different regions of the world, such as Image Gently, EuroSafe, AfroSafe, Latin Safe, and ArabSafe. For her contribution to the radiation protection of children Dr. María Pérez was distinguished with the Image Gently Butterfly Award in 2015.

Dr. María Pérez represented WHO in the Joint Secretariat of co-sponsoring organizations that carried out the revision of the International Basic Safety Standards (BSS) for Protection against Ionizing Radiation and for the Safety of Radiation Sources. She represents WHO at the Inter-Agency Committee on Radiation Safety (IACRS), and in this capacity she is currently member of the IACRS BSS Implementation Task Group. She also represents WHO at the IAEA Radiation Safety Standards Committee (RASSC), the UNSCEAR Committee, the EC Group of Scientific Experts referred to in Article 31 of the Euratom Treaty, the EC Article 31 Working Party on Medical Exposures (WPME), the Working Group on Medical Applications of the European Association of Competent Authorities on Radiation Protection (HERCA WGMA) and the Project on Radiation Safety Culture in Healthcare jointly developed by IRPA with IAEA, IOMP and WHO.

Dr. María Pérez is the designated technical officer for the WHO collaboration with the International Commission on Radiological Protection (ICRP), the International Society of Radiology (ISR), International Society of Radiographers and Radiological Technologists (ISRRT), the International Organization on Medical Physics (IOMP) and RAD-AID International Foundation.

Dr. María Pérez has been strongly devoted to support the WHO response to the Fukushima Daiichi NPP accident by closely monitoring and addressing the public health risks and the information needs from member states, mass media, and general public.

Dr. María Pérez is member of the Argentine Radiation Protection Society (SAR) and the French Society of Radiation Protection (SFRP). Since 1981 to present, Dr. María Pérez has participated in numerous scientific events on the different topics of radiation protection performing different tasks: organizing conferences, coordinating meetings, delivering presentations, chairing session, moderating round tables, delivering refresher courses, as jury in awards and as scientific secretary of congresses, among others.

Dr. María Pérez is the author of more than 100 articles and publications in specialized journals; she performs academic activities in many courses and contributes to the implementation of education and training programs in radiation protection in different region of the world.

Professor Eliseo Vañó

(eliseov@med.ucm.es)



Impact in scientific practice of Radiation Protection

Prof. Vañó was the first Full Professor of Medical Physics at the Spanish Universities and promoted the creation of the Medical Physics Expert Degree and the centralized Radiation Protection and Medical Physics Services in Spain.

Since 2001 Prof. Vañó has been a full member of the International Commission on Radiological Protection (Committee 3 on Protection in Medicine). In 2005, he was appointed secretary of Committee 3 and in July 2009, Chairman of the Committee. He has been serving ICRP for 16 years. During these years he has been involved in the preparation and publication of eight key documents of ICRP. Currently Prof. Vañó is Emeritus Member of the Main Commission of ICRP.

Participation in national and international organizations for Radiation Protection and Medical Physics

Prof Vañó has been nominated honorary member of the Spanish Society of Medical Physics, the Spanish Society of Radiation Protection and the Spanish Society of Vascular and Interventional Radiology. He also received the Barclay Medal of the British Institute of Radiology in 1996 and the International Union for Physical and Engineering Sciences in Medicine Awards of Merit in 2018.

Prof. Vañó has been member of the Editorial Board of several recognized scientific journals of Medical Physics and Radiological Protection (Physica Medica: European Journal of Medical Physics, Journal of Radiological Protection, British Journal of Radiology, Medical Physics AAPM, etc).

Prof. Vañó is a member of the Article 31 Group of Experts of the EURATOM Treaty since 2002. He is also a member of the Medical Working Party on Medical Exposures since 1995 and has been acting as its Chairman since 2009 until 2015.

Prof. Vañó is a consultant of the International Atomic Energy Agency (IAEA) for topics concerning medical exposures during more than 25 years and has been involved in missions in many Latin American, Asian, African and European Countries. He has contributed many of the IAEA training packages for radiation protection in medicine.

He has been member of several working groups of the International Electrotechnical Committee (IEC), member of the Scientific Committee of the International Organization of Medical Physics (IOMP) and member in some working groups of the Organization for Economic Cooperation and Development (OECD) and the Nuclear Energy Agency (NEA).

Prof. Vañó was appointed as Scientific Expert by the Spanish Ministry of Health to represent Spain in several international Committees and at the International Action Plan of Radiation

Protection of Patients (IAEA and WHO). He is also a member of the Spanish delegation in UNSCEAR.

Current Position

Prof. Eliseo Vañó has a PhD in Nuclear Physics (1974) and was qualified by the Spanish Education Authority as a “Medical Physics Expert” in 1999. In 1982, he became Full Professor of Medical Physics at the Radiology Department at the Medical School of the Complutense University of Madrid (Spain). He has been the Head of the Medical Physics Service at the San Carlos University Hospital in Madrid from 1984 to 2017. Currently he is Emeritus Professor at the Radiology Department of the Complutense University in Madrid.

Scientific activities

He has led more than 30 research projects, 15 of them funded by the European Commission, mainly dealing with image quality and patient and staff dosimetry in medical imaging and interventional radiology. Prof. Vañó is author of different chapters in more than 10 scientific books and co-author of several IAEA Technical reports. Prof. Vañó has supervised eight PhD Theses. He is co-author in 298 publications included in the Web of Science with an h-index of 39 and 5224 citations.

Prof. Vañó has had an active role in the education and training of radiation protection at the medical schools in Spain. He has also been active in most of the national and international Congresses on Medical Physics and Radiation Protection.

ANNEX D: PROCEDURE TO BE FOLLOWED IN ADMINISTRATING THE
 ROLF M. SIEVERT AWARD

Revised and adopted - April 1991, April 1996 and May 2004

The Sievert Award is made in recognition of outstanding contributions to radiological protection, which honours the memory of a leader and pioneer in radiological protection, Professor Rolf Sievert. The recipient must be pre-eminent in the discipline and in accepting the award must agree to and be in a position to present the Sievert Lecture at the following International Congress.

1. In the first year after an International IRPA Congress, the Vice-President of the Association, in his capacity as ex officio chairman of the Sievert Award Committee, shall nominate for appointment by the President the six other members of the committee. All shall be members of IRPA; two shall be the two most recent and available past Presidents of IRPA, and one only shall be an Executive Council Member.
2. At each General Assembly the President shall invite Associate Societies to submit nominations for the Sievert Award. Approximately 3 years before the next International IRPA Congress, the Vice President, will repeat this invitation in writing to all presidents of all Associate Societies. Associate Societies shall submit their nominations for the Sievert Award to the Vice-President of the Association not later than 2 years before the next International IRPA Congress. Nominations must be of people who are not currently members of either the Executive Council or the Sievert Award Committee.
3. A nomination must be accompanied by a supporting statement to justify the nomination, and be sent to the Vice-President of the Association as chairman of the committee.
To guide the Award Committee in evaluating nominations, the IRPA-society that makes the nominations should provide as a minimum for each candidate:
 - A 250-word outline of the particular contributions the candidate has made in the field of radiation protection that are the basis for the nomination and that would justify the candidate's selection as the recipient of the Award.
 - The formal assurance that the candidate is the official nominee of an IRPA Associate Society.
 - A current CV for the candidate, including a summary, approximately 500 words, of the candidate's career.
 - Any pertinent supporting documentation.
4. The committee shall place these names in order of preference for submission to the Executive Council at least one year before the Congress.
5. The Executive Council shall decide whether, at the forthcoming IRPA Congress, the Sievert Award shall be made to either of the first two nominees of the Sievert Award Committee or whether the Award shall not be made. If a recipient is selected, he must be so notified at least eight months before the Congress.
6. The recipient of the Sievert Award is expected to deliver the Sievert Memorial Lecture at the Congress, and make a copy of the lecture available to the Publications Director for publication. If the person selected declines the Award, or is unable to deliver the lecture, the Executive Council may decide to make the Award to the other of the first two nominees of the Sievert Award Committee or, failing this,

to another nominee taking into account the order of preference expressed by that committee. If the inability of the person selected to deliver the lecture at the International IRPA Congress arises from illness or some other personal reason, the Executive Council may nevertheless decide to make the Award to him and to present it in the most appropriate way.

7. As soon as a recipient has agreed to deliver a lecture at the Congress and has indicated its title, the President shall announce to all Associate Societies the name of the recipient of the Sievert Award and the title of the Sievert Lecture.
8. The Sievert Award shall consist of a suitable scroll or certificate containing the name of the recipient, the date it was presented, an indication of what the Award represents, and must note the fact that it honours the memory of Professor Rolf M. Sievert. An Award of \$5,000 shall be paid to the recipient for honorarium and travel expenses to enable him to deliver the lecture at the IRPA Congress.
9. Directions to the Award Committee members on receipt of the nomination material:
 - a. Consider the nominees and decide which of the candidates is the most meritorious. If none of the nominees are considered to be sufficient stature, then the Award will not be bestowed.
 - b. Write this individual's name against "First (1st)" on the attached ballot.
 - c. Decide which of the remaining candidates is the next most meritorious.
 - d. Write this individual's name against "Second (2nd)" on the attached ballot.
 - e. Repeat Step #c and #d for "Third (3rd)", etc. until there are no more candidates.
 - f. Sign the ballot form and return to the Chairman of the Award Committee.
10. Consolidation of rankings by the Chairman after receiving completed Ballot sheets:
 - a. Any individual that a majority of the Committee decide is ineligible is removed from further consideration.
 - b. If there are more than two eligible individuals, the top two choices are decided by a paired outranking comparison. In this comparison, for each of the ballots, the number of times each candidate is ranked higher than the other candidates is tabulated. The number of outranking for each of the candidates is totalled across all the ballots (see example following).
 - c. If this fails to select the top two, then the tie is broken by selecting, from the tied individuals, the individual who was selected as "First (1st)" most times. If this does not break the tie, then the selection is from the remaining tied individuals on the basis of most "Second (2nd)" selections.
 - d. The results of the balloting are summarized and sent to Award Committee members for formal endorsement of the result. A response form worded to allow transmission by unsecured fax can help to reduce delays (see attached example).
 - e. The formal recommendation of the Award Committee is presented to the Executive Council.

12. Hypothetical example of an Award Committee balloting on 6 candidates

Ranking by Committee members (1 is first etc.)

	Candidate	Candidate	Candidate	Candidate	Candidate	Candidate
	A	B	C	D	E	F
Member a	2	1	6	4	3	5
Member b	3	4	5	6	1	2
Member c	1	3	4	6	2	5
Member d	3	2	5	6	1	4
Member e	3	2	4	5	1	6
Member f	3	1	5	4	2	6
Member g	3	2	4	6	1	5

Outranking table - number of times the candidate at the left of the row outranks the candidate at the top of the column

	A	B	C	D	E	F	Outranking points	Top candidates
A	x	2	7	7	2	6	24	
B	5	x	7	7	2	6	27	**
C	0	0	x	5	0	4	9	
D	0	0	2	x	0	3	5	
E	5	5	7	7	x	7	31	
F	1	1	3	4	0	x	9	