2021 Annual Report

Established in Stockholm 27 July 1928
2021 was another challenging and rewarding year for ICRP as we experienced significant changes and tremendous success while continuing to navigate the pandemic. Before discussing this in more detail, however, let me first acknowledge and thank the many dedicated volunteers on our Task Groups, Committees, and Main Commission who moved on from ICRP at the conclusion of the 2017-2021 term. Their efforts paved the way towards the planned review and revision of the System of Radiological Protection.

While there were so many who were instrumental in our successes over the years, I would especially like to thank Chair Claire Cousins and Vice-Chair Jacques Lochard for their leadership and vision that guided ICRP for over a decade. We wish them the best in their next chapter, and we are confident that their passion, input, and experience will continue to be available to us in some capacity in the years to come.

Looking ahead, we’re excited that our new term (2021-2025) includes about 40% new members who are bringing new energy and fresh perspectives to ICRP. We have recently embarked on a decade-long journey to review and revise the System of Radiological Protection, which is going to require more engagement, resources, collaboration, and effort than we have ever undertaken. We invite the international radiological protection community to play a constructive role in this process, and we’re looking forward to working with them.

Of course, to know where you’re going, you need to acknowledge where you’ve been. In this report, you will see many of the highlights that guided us through the last year. We released two significant open-access papers, “Keeping the ICRP Recommendations Fit for Purpose” and “Areas of Research to Support the System of Radiological Protection”, which will both serve as foundational and guiding documents for the revision of the System.

In October, we hosted the “Future of Radiological Protection” Digital Workshop, which included 63 live and on-demand presentations, and 1500+ registrants from almost 100 countries. There was a flexible fee to attend, and by making it optional, those with limited financial resources were still able to access and participate. This model turned out to be quite successful. As we strive for attendance equity, accessibility, and inclusiveness at all ICRP events, you can expect to see similar fee structures at our digital events moving forward. Many key messages and important topics from the Workshop summarised in another open access paper published in the Journal of Radiological Protection.

Our Main Commission was able to meet face-to-face in November 2021 in Frankfurt, Germany, for the first time since the start of pandemic, which provided a sense of optimism that future in-person gatherings were not too far away. It is with that optimism in mind, that we look forward to welcoming the global RP community to Vancouver, British Columbia (7-10 November 2022) for the 6th International Symposium on the System of Radiological Protection, ICRP 2021+1. It’s hard to believe that this will mark our first major in-person event in almost three years. With so much happening between then and now, and the critical role it will play in the review and revision of the System, we sincerely hope that professionals and organisations from around the world will strongly consider participating.

See you in Vancouver,

Werner Rühm
ICRP Chair
ICRP launched a major review of the System of Radiological Protection with the aim to develop revised General Recommendations that would replace the 2007 Recommendations of ICRP in about a decade. While the System is robust and has performed well, it must adapt to address changes in science and society to remain fit for purpose. Two open-access papers invited interested individuals and organisations to engage in the open process: Keeping the ICRP Recommendations Fit for Purpose (Clement, et al.) and Areas of Research to Support the System of Radiological Protection (Laurier, et al.).

The first major opportunity to react to the invitation to engage in the review and revision of the System, the Future of Radiological Protection Digital Workshop, was held online 14 October – 3 November. With 63 live and on-demand presentations, the event attracted about 1500 people from 100 countries. An open access Summary of the 2021 ICRP Workshop on the Future of Radiological Protection (Rühm, et al.) was published in early 2022.

On March 11th, ICRP issued a statement ‘Ten Years after the Fukushima Daiichi Accident’, remembering the tragic losses, reflecting on progress made, considering challenges that still lie ahead, and committing to continue learning from the experience.

ICRP 2021, the 6th International Symposium on the System of Radiological Protection was postponed due to pandemic travel restrictions. It was renamed ICRP 2021+1, and rescheduled to 7-10 November 2022, still in Vancouver, Canada.
Three draft publications were released for public consultation:
• Occupational Intakes of Radionuclides: Part 5
• Occupational Radiological Protection in Brachytherapy
• Radiological Protection in Veterinary Medicine

On the first of January, the free-to-access library of ICRP publications was extended to the 2019 issues of Annals of the ICRP thanks to the many organisations and individuals that supported the Free the Annals initiative. The following publications were released to the public:

Five new publications were released:
• Proceedings of the International Conference on Recovery after Nuclear Accidents: Radiological Protection Lessons from Fukushima and Beyond
• ICRP Publication 150 Cancer Risk from Exposure to Plutonium and Uranium
• ICRP Publication 149 Occupational Radiological Protection in Brachytherapy
• ICRP Publication 148 Radiation Weighting for Reference Animals and Plants
• ICRP Publication 147 Use of Dose Quantities in Radiological Protection

Two new emeritus members were appointed: Madan Rehani (Committee 3) and Jean-François Lecomte (Committee 4). This honorary distinction recognises extraordinary contributions to ICRP and is conferred for life.
ICRP develops the System of Radiological Protection for the public benefit. The System takes account of the latest scientific knowledge, ethical values, and practical experience. It is the basis of standards, legislation, guidance, programmes, and practice worldwide.

The objective of the System is to contribute to an appropriate level of protection for people and the environment against the harmful effects of ionising radiation exposure without unduly limiting the individual or societal benefits of activities involving radiation.

The System of Radiological Protection is based on the latest science, social and ethical values, with over a century of experience since the discovery of ionising radiation.

ICRP recommendations are used worldwide by intergovernmental and nongovernmental advisory and standard setting agencies; government regulatory authorities; educational, scientific, and healthcare institutions; operators; individual professionals; and others with an interest in radiological protection.

The IAEA International Basic Safety Standards for Protection against Ionising Radiation and for the Safety of Radiation Sources is based heavily on ICRP recommendations, as are the similar European Basic Safety Standards. The International Labour Organization Convention 115, Radiation Protection Convention, General Observation 2015, refers specifically to the recommendations of ICRP.
More than a decade since the current fundamental recommendations were released, ICRP has opened a review and revision of the System of Radiological Protection, ensuring it continues to protect people, animals, and the environment for the next generation.
ICRP is comprised of over 300 of the world’s leading radiation experts. We are the “keepers” of the System of Radiological Protection, but the System exists for those who use it to protect patients, workers, the public, and the environment. Collaboration with the people it impacts the most is essential.

This workshop created an opportunity to engage in the review and revision of the System of Radiological Protection, in particular based on two open-access papers recently published by ICRP:

Keeping the ICRP Recommendations Fit for Purpose (Clement, et al.)

Areas of Research to Support the System of Radiological Protection (Laurier, et al.)

The digital workshop took place 14 October to 3 November 2021. It included two Live Sessions per day, on 19-20 October 2021, as well as 43 On-Demand Presentations that were available from 14 October 2021 until 3 November 2021.

The event was summarised in the open-access paper:

Summary of the 2021 ICRP Workshop on the Future of Radiological Protection (Rühm, et al.)

Recordings of all live session and on-demand presentations for this event can be viewed at www.icrp.org/events
## FINANCES

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<th>INCOMING RESOURCES</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
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<tr>
<td>Contributions Received</td>
<td>1,111,734</td>
<td>1,017,495</td>
<td>761,044</td>
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<td>Royalties</td>
<td>229,585</td>
<td>124,153</td>
<td>198,793</td>
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<td>Other</td>
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<td>89,279</td>
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<td>Total Incoming Resources</td>
<td>1,341,319</td>
<td>1,141,648</td>
<td>1,040,116</td>
<td>1,219,696</td>
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<tr>
<th>RESOURCES EXPENDED</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
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</thead>
<tbody>
<tr>
<td>Promotion of Radiological Protection</td>
<td>430,422</td>
<td>781,865</td>
<td>315,982</td>
<td>379,066</td>
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<td>Governance Costs</td>
<td>509,784</td>
<td>494,158</td>
<td>438,986</td>
<td>482,716</td>
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<td>Other Resources Expended</td>
<td>(6,832)</td>
<td>34,531</td>
<td>4,744</td>
<td>52,326</td>
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<td>Total Resources Expended</td>
<td>933,374</td>
<td>1,310,554</td>
<td>759,712</td>
<td>914,108</td>
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</tbody>
</table>

| NET MOVEMENT IN RESOURCES | 407,945  | (168,906) | 280,404 | 305,588 |

| TOTAL FUNDS CARRIED FORWARD | 659,313 | 490,407 | 770,811 | 1,076,399 |
Originally established at the Second International Congress of Radiology in 1928 as the International X-ray and Radium Protection Committee, today ICRP is an independent international charity registered in the UK, relying on financial contributions and support from governments, industry, agencies, foundations, and individuals from around the world.

ICRP consists of the Main Commission, the Scientific Secretariat, four standing Committees, and Task Groups established as needed to undertake specific work. Members come from over 40 countries and all disciplines relevant to radiological protection. They are invited to join ICRP as independent experts on a volunteer basis for four-year terms. Representatives of organisations in formal relations with ICRP are regularly invited to both advise the Main Commission and to participate in meetings of the Committees. Individuals from these organisations may be invited to be members of Task Groups or to review drafts of work in progress where their expertise is particularly relevant.

This structure supports a rigorous system of peer review. The work of Task Groups is reviewed by the relevant Committee(s), and then reviewed and approved by the Main Commission. During development, most reports are circulated to several organisations and individual experts for critical review and all are posted for public consultation through the ICRP website.
MAIN COMMISSION

The Main Commission consists of the Chair and up to twelve other members. The Main Commission is the governing body, setting the policy and programme of work, and approving all official publications.

Werner Rühm
Chair

Donald Cool
Vice-Chair

Kimberly Applegate
Committee 3 Chair

Dominique Laurier
Committee 1 Chair

François Bochud
Committee 2 Chair

Kun Woo Cho
Member

Thierry Schneider
Committee 4 Chair

Simon Bouffler
Member

Senlin Liu
Member

Gillian Hirth
Member

Michiaki Kai
Member

Sergey Romanov
Member

Andrzej Wojcik
Member

SCIENTIFIC SECRETARIAT

The Scientific Secretariat manages the daily business of ICRP, and the Scientific Secretary often represents ICRP at international meetings.

Christopher Clement
Scientific Secretary & CEO

Hiro Fujita
Assistant Scientific Secretary

Lynn Lemaire
Executive Administrator

Kelsey Cloutier
Head of Stakeholder Engagement and Communications

Charlotte White
Brand and Digital Media Specialist

Toshihiro Higuchi
Historian
COMMITTEE 1
EFFECTS

Considers the effects of radiation action from the subcellular to population and ecosystem levels, and assesses implications for protection of people and the environment

Dominique Laurier, Chair
Gayle Woloschak, Vice-Chair
Christophe Badie, Secretary

Christelle Adam-Guillermin
Elizabeth Ainsbury
Tamara Azizova
Dimitry Bazyka
Agnès Francois
Manoo Prakash Hande
Michael Hauptmann
Kotaro Ozasa
Preetha Rajaraman
David Richardson
Yoshiya Shimada
Mikhail Sokolnikov
Quanfu Sun
Ludovic Vaillant
Richard Wakeford

COMMITTEE 2
DOSE

Develops dosimetric methodology for the assessment of internal and external radiation exposures for use in the protection of people and the environment

François Bochud, Chair
Francois Paquet, Vice-Chair
Maria Antonia Lopez, Secretary

Martin Andersson
Volodymyr Berkovskyy
Denison de Souza Santos
Augusto Giussani
Derek Jokisch
Chan Hyeong Kim
Mukund Shrinivas Kulkarni
Stephanie Lamart
Choonsik Lee
Junli Li
James W. Marsh
Nina Petoussi-Henss
Tatsuhiko Sato
Tracy Smith
Alexander Ulanowski
COMMITTEE 3  MEDICINE
Addresses protection of persons and unborn children when ionising radiation is used in medical diagnosis, therapy, and biomedical research, as well as protection in veterinary medicine

Kimberly Applegate, Chair
Colin Martin, Vice-Chair
David Sutton, Secretary

Marie-Claire Cantone
John Damilakis
Makoto Hosono
Aurelie Isambert
Mika Kortesniemi
M. Mahesh
Josep M. Martí-Climent
Jin Chul Paeng
Claudia E. Ruebe
William Small
Aste Sovik
Isabelle Thierry-Chef
Ivan Williams
Weihai Zhuo

COMMITTEE 4  APPLICATION
Provides advice on the application of the Commission’s recommendations for the protection of people and the environment in an integrated manner for all exposure situations

Thierry Schneider, Chair
Nicole Martinez, Vice-Chair
Jacqueline Garnier-Laplace, Secretary

Julie Burtt
Min Baek
Nobuhiko Ban
Yann Billarand
Analia Canoba
Eduardo Gallego
Daniele Giuffrida
Catrin Baureus Koch
Yahong Mao
Andy Mayall
Anne Nisbet
Sergey Shinkarev
John Takala
Hiroko Yoshida
Friedo Zölzer
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<td>Radiation Risk Inference at Low-dose and Low-dose Rate Exposure for RP Purposes</td>
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<td>TG 95</td>
<td>Internal Dose Coefficients</td>
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<td>Computational Phantoms and Radiation Transport</td>
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<td>TG 108</td>
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Click on a Task Group to learn more about their work.
TASK GROUPS
Active as of 31 December 2021

TG 109
Ethics in RP for Medical Diagnosis and Treatment

TG 110
RP in Veterinary Practice

TG 111
Factors Governing the Individual Response of Humans to Ionising Radiation

TG 112
Emergency Dosimetry

TG 113
Reference Organ and Effective Dose Coefficients for Common Diagnostic X-Ray Imaging Examinations

TG 114
Reasonableness and Tolerability in the System of RP

TG 115
Risk and Dose Assessment for RP of Astronauts

TG 116
RP Aspects of Imaging in Radiotherapy

TG 117
RP in PET and PET/CT

TG 118
Relative Biological Effectiveness (RBE), Quality Factor (Q), and Radiation Weighting Factor (wR)

TG 119
Effects of Ionising Radiation on Diseases of the Circulatory System and Their Consideration in the System of RP

TG 120
RP for Radiation Emergencies and Malicious Events

TG 121
Effects of Ionising Radiation Exposure in Offspring and Next Generations

Click on a Task Group to learn more about their work
PUBLICATIONS RELEASED IN 2021

Annals of the ICRP is the authoritative source of recommendations and guidance written by the International Commission on Radiological Protection. It was established in 1977 and is published by SAGE UK.

Thanks to the many organisations and individuals that supported the Free The Annals initiative, two years after publication all issues are free to download. The latest issues are available by subscription or can be purchased individually from SAGE.

PUBLICATION 147
Use of Dose Quantities in Radiological Protection

Recommended citation

Authors on behalf of ICRP
J.D. Harrison, M. Balonov, F. Bochud, C. Martin, H.-G. Menzel, P. Ortiz-Lopez, R. Smith-Bindman, J.R. Simmonds, R. Wakeford

PUBLICATION 148
Radiation Weighting for Reference Animals and Plants

Recommended citation

Authors on behalf of ICRP
K. Higley, A. Real, D. Chambers
PUBLICATION 149

Occupational Radiological Protection in Brachytherapy

Recommended citation

Authors on behalf of ICRP

PUBLICATION 150

Cancer Risk From Exposure to Plutonium and Uranium

Recommended citation

Authors on behalf of ICRP

Proceedings of the International Conference on Recovery after Nuclear Accidents: Radiological Protection Lessons from Fukushima and Beyond

Recommended citation
The contributions from these organisations allow ICRP to further our programme of work, paving the way for the advancement of the system of radiological protection globally. Want to join this growing list of organisations at the forefront of radiological protection? Contact us.
ICRP maintains formal relations with other organisations with an interest in radiological protection through specific agreements, or by granting Special Liaison status to organisations whose work is relevant to ICRP’s mandate. Organisations currently in formal relations with ICRP are shown below.
ICRP2021+1
7-10 Nov 2022 • Vancouver

Come for the waves, Stay for the mountains. See you at ICRP2021+1.

6th International Symposium on the System of Radiological Protection
ICRP2021.COM

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