ICNIRP
INTERNATIONAL COMMISSION ON
NON-IONIZING RADIATION PROTECTION

ICNIRP ACTIVITIES

ANNUAL REPORT 2022

This report summarizes the activities of the Commission for the period between 1st January 2022 and 31 December 2022.

Science

Work Plan 2020-2024

A range of project groups are currently underway that will provide important information for improving non-ionizing radiation health and safety.

Statements on RF Knowledge Gaps

A Project Group on "Knowledge gaps identified during guidelines' development" was set up under the leadership of Dr Carmela Marino to draft a research agenda for the whole NIR spectrum, based in particular on the gaps identified during guidelines development. The ICNIRP research agenda aims at identifying knowledge gaps relevant for giving protection guidance. After publication in 2020 of the ICNIRP Statement on Gaps in Knowledge Relevant to the "Guidelines for Limiting Exposure to Radiofrequency Time-Varying Electric and Magnetic Fields (1 Hz - 100 kHz) 2010" (Health Physics 118(5):533-542; 2020, available on the ICNIRP website), the Project Group is now developing a similar document on RF Knowledge Gaps.

Revision of the Statement on Laser Pointers

The Project Group on "Laser Pointers" under the leadership of Dr Tsutomu Okuno is in charge of the revision of the ICNIRP Statement on Laser Pointers (Health Phys 77(2):218-220:1990).

Handheld laser products, often called laser pointers, sold especially online, sometimes have potentially hazardous output power but are improperly labelled for a lower hazard class. Such products have caused retinal injuries. Thus, there is a concern over the safety of handheld laser products. ICNIRP provides information on hazards posed by handheld laser products in its statement (Health Phys 77(2):218-220:1990) in order to increase awareness of laser hazards with the aim of preventing incidents involving retinal injuries, visual disturbances and other adverse effects caused by handheld laser products and to address the public concern over safety of these products. The purpose of the revised statement is to update this guidance.

Short Wavelength Light and Circadian Rhythm

The Project Group on "Short Wavelength Light" under the leadership of Dr Sharon Miller is developing a statement on the effects of short wavelength light on circadian rhythm.

Over the past 20 years exposure to short wavelength light (SWL) has rapidly increased, in particular through the extensive use of smartphones and tablets. The ICNIRP Project Group is to address the issue related to possible adverse effects of SWL on the human circadian timing system and its impact on sleep-wake rhythms. The statement will provide an overview of the current use of SWL sources, their emission characteristics and the physiological changes and potential adverse health effects resulting from exposure. Based on this, further guidance will be provided as well as recommendations for future research to adequately assess potential adverse effects of SWL.

Effects of EMFs on the Environment

Under the leadership of Dr Eric van Rongen, a Project Group will undertake a statement on the effects of NIR on the environment (plants and animals in their natural environment). The Project Group was constituted in 2022 after an exploratory phase. Meetings of the PG are expected in 2023.

As identified by ICNIRP in 2000 and confirmed more recently in 2019 by the German Federal Office (BfS), whether there are effects of EMFs on the living environment is yet to be determined, with this uncertainty largely due to the lack of adequate data. Accordingly, the ICNIRP Project Group intends to present an overview of the environmental effects of EMFs and, where possible, analyze whether the current human exposure guidelines are sufficiently protective for plants and animals in their natural environment.

Revision of the Laser Guidelines

In light of the 2020 ICNIRP Comments on the Laser Guidelines and recent data, a Project Group under the leadership of Dr Tsutomu Okuno is in charge of revising the 2013 ICNIRP Laser guidelines (Health Phys 105(3): 271-295: 2013). A fact sheet summarizing the changes is also expected.

Lasers are used in a wide variety of industrial, consumer, scientific, and medical applications, including optical fiber communication, welding, cutting, drilling, distance measurement, entertainment, optical computing, and surgery. To protect the general population and workers from exposure to laser radiation, ICNIRP provides guidelines which sets the maximum levels of exposure permitted to avoid adverse biological effects to the eyes and the skin. The guidelines also assist with the development of principles of protection against laser radiation hazards.

In 2013 ICNIRP published guidelines on limits of exposure to laser radiation of wavelengths between 180 nm and 1,000 µm (ICNIRP 2013). Since then the application of the limits has shown that some additional guidance was needed for complex exposure cases. These were addressed in the 2020 ICNIRP Statement "Comments on the 2013 Laser Guidelines". As mentioned in that Statement, the revision of the guidelines will also aim to provide additional guidance in relation to the limits for long term exposures in the far ultraviolet wavelength range below 280 nm, the definitions of the exposure limits for small-spot exposures of durations less than 1 ns, and the determination of specific reduction factors and associated exposure limits, with particular consideration of multiple pulses. This revision will mainly reflect available new data identified as necessary by ICNIRP.

Revision of the LF Guidelines (≤10 MHz)

A Project Group under the leadership of Dr Rodney Croft will develop an updated set of low frequency guidelines, combining, and relative to that of ICNIRP 2009 (static magnetic fields), ICNIRP 2010 (low frequency fields) and ICNIRP 2014 (induced electric fields). Where appropriate, the underlying logic of the 2020 RF guidelines will be used. The output of this Project Group may subsequently be combined with the 2020 RF guidelines to form a single set of guidelines (up to 300 GHz). Note that this Project Group will not review the dosimetry literature, as that is covered by a separate Project Group (low frequency dosimetry).

LF Dosimetry Review

A systematic review of the LF dosimetry and related physics will be prepared by a Project Group led by Dr Akimasa Hirata. This will provide the dosimetry basis for the revision of the LF Guidelines (see

above). Following the constitutive and exploratory phase, the PG organized working meetings to advance the project.

Exposure to Ultrasound

A Project Group, under the leadership of Dr Ken Karipidis, is to investigate whether the available data on ultrasound exposure require the development of exposure guidelines or a general statement on safety, and to prepare a recommendation for the development of either guidelines or a statement for consideration by the ICNIRP Commission.

Protection of patients from exposure to ultrasound for medical purposes is controlled through international standards and national regulations. ICNIRP has published recent statements on the use of ultrasound for diagnostic (Health Phys 112(3):305–321; 2017) and cosmetic purposes (Health Phys 118(5):562–579; 2020). Protection against airborne ultrasound has not been evaluated for a while, and interim guidelines on human exposure were published by the International Radiation Protection Association in 1984.

Following the constitutive and exploratory phase, the PG held working meetings to advance the project and started developing a draft.

Long-Term Effects of Chronic UV Exposure

A Project Group, led by Dr Nigel Cridland, is to review existing evidence in relation to long-term effects on the eye and the skin for which chronic exposure to UV may be a contributing factor. These will include effects on the cornea/conjunctiva (pterygium, pingueculae and climatic droplet keratopathy), the lens (cataract), the retina (macular degeneration) and the skin (photoageing and cancer). For ocular effects, the Project Group will consider whether the evidence is sufficient to enable the formulation of advice on restricting exposure and whether this would be substantively different from existing advice on the avoidance of adverse effects from acute exposure. For effects on the skin, which is already considered in the existing guidelines, the project group will consider whether advances in knowledge over the last 15 years are sufficient to justify any changes to the guidelines.

Following the constitutive and exploratory phase, the PG started to work via online meeting and electronic exchanges.

Communication and Publications

Communication activities

The Subproject Group on Communication led by Ken Karipidis put together a Statement on the role of ICNIRP. This document was drafted as an external communication tool. It was issued in Health Physics and is quotable as below. The paper clarifies many questions in particular regarding alleged industry ties and conflict of interests that the public including regulators have asked.

In this statement, ICNIRP presents its structure, its activities, and general approach to providing guidance on NIR protection. The statement highlights ICNIRP's independence and presents the principle and requirements of no commercial or other vested interests. ICNIRP's funding arrangements and collaboration with other advisory bodies and radiation protection authorities are also described. The statement finally

also presents the types of guidance documents that are produced by ICNIRP and the general approach in assessing scientific evidence.

Journal Publications

ICNIRP Statement: A Description of ICNIRP'S Independent, Best Practice System of Guidance on the Protection of People and the Environment from Exposure to Non-Ionizing Radiation. Health Phys. 122(5):625–628; 2022

Collaboration

Collaboration with International Organizations

World Health Organization (WHO)

ICNIRP is officially recognized by the World Health Organization as a collaborative NGO for all aspects of non-ionizing radiation protection within the Framework of Engagement with Non State Actors (FENSA). The collaboration is mainly related to WHO's International EMF project, and INTERSUN Program. Within the cooperation, ICNIRP provides input to support the development of guidance on NIR exposure.

European Commission (EC)

ICNIRP advances radiation protection science throughout Europe and the World, in particular through the support provided by the European Union (ESF/SOCPL). ICNIRP provides, upon request, scientific advice for the evaluation and interpretation of scientific data, and for their dissemination, especially to the Directorate General "Employment, Social Affairs and Inclusion". Communication with the DG unit takes place also through participation to workshops and meetings, such as this year's International Day Session during the ICNIRP Commission Meeting.

International Labour Organization (ILO)

The partnership between ICNIRP and ILO dates back to 1994 when ICNIRP was admitted on the ILO's Special List of Non-Governmental Organizations. Since then several publications have been jointly issued, particularly in relation to EMF and Ultraviolet radiation. Collaboration also is set up in an ad hoc manner on topics discussed within the radiation protection community.

International Radiation Protection Association (IRPA)

ICNIRP and IRPA are linked through their Charter and their cooperation is within this framework. IRPA provides information on ICNIRP activities on the IRPA website regarding ICNIRP publications, current online consultations, the organization of conferences, and its elections. IRPA is invited to provide comments on the ICNIRP guidelines drafts and to provide nominations at ICNIRP Commission elections.

In 2022 at the request of the newly created IRPA NIR Task Group, ICNIRP met online during its Annual General Meeting with one of its Chair, Dr Julien Modolo. He stated that their aim was to consult ICNIRP about the Task Group future work areas that ICNIRP would think beneficial and check about possible collaboration opportunities related to communication. The TG will primarily focus on communication and in particular

provide information to the general public about NIR effects in the 19 countries where the 23 IRPA societies are located. The terms of reference of the entity are available on the IRPA website.

International Session at the ICNIRP Commission Meeting

ICNIRP re-launched its International Session within the Commission Meeting on 17 June 2022 dedicated to meeting with international partners in radiation protection with the aim of exchanging ideas on current and future challenges in radiation protection, identifying goals, expectations and potentials for common activities. The following guests attended the session online and provided their input: John O'Hagan, International Commission on Illumination (CIE), Ralf Kleinschmidt, European Commission Directorate General Employment, Social Affairs and Inclusion (EC DG EMPL), Marc Wittlich, International Commission on Occupational Health (ICOH), Werner Rühm, International Committee on Radiological Protection (ICRP), Klaus Henrichs, International Radiation Protection Association (IRPA), Haim Mazar, International Telecommunication Union (ITU), and Emilie van Deventer, World Health Organization (WHO). In general, the invited delegates expressed their interest in strengthening their collaboration on the basis of specific ad-hoc projects. One major topic of common interest is related to the continuous development of the Radiation Protection System.

Other collaboration

Part of the ICNIRP mission is to provide scientific advice on NIR protection in many countries worldwide (see below list of meetings and conferences). These activities are performed mostly through participation in seminars, round tables, provision of lectures in training courses and scientific conferences, as well as meetings with protection agencies.

Workshops and Meetings organized by ICNIRP or with ICNIRP participation

As a widely recognized international organization in non-ionizing radiation protection, ICNIRP is invited to participate in, or co-sponsor, many international scientific events. In the period covered by this report, ICNIRP has organized and/or contributed to the following meetings:

- ICNIRP Mini-Symposium Hybrid- Nagoya, Japan 19 June 22

ICNIRP hosted a mini-symposium ahead of BioEM2022 on 19 June 2022. More than 150 participants from around the world online and onsite shared this opportunity to learn about ICNIRP and its current and planned activities, to get an update on some key radiation safety issues, and to address questions raised by members of the radiation protection community before and during the event.

The formal presentations focused on two main issues. The first related to compliance with and implementation of the ICNIRP 2020 Radiofrequency Guidelines. This is an issue that ICNIRP has received many questions about, and although ‘compliance’ itself is not within the remit of ICNIRP, the presentations put together by ICNIRP are aiming at providing supportive information to help those working through such issues. The second related to ultraviolet radiation, and what the current science says about harm associated with exposure to it. This considered effects of UV-A/B on the

skin and lens of the eye, as well as addressed the question of whether germicidal UV-C techniques may pose a risk to those exposed to it.

The mini-symposium also included an extended opportunity for questions and suggestions as ICNIRP is keen to better understand which issues are of greatest concern to the radiation protection community and to discuss them together.

Participation of ICNIRP representatives in Workshops, Scientific Meetings and Courses

• IRPA 6th European Congress on Radiation Protection	Hybrid/Budapest	30 May - 03 June 22
• BioEM 2022 Conference	Hybrid/Nagoya	19 June – 24 June 22
• 6th African Congress of the International Radiation Protection Association (IRPA) Theme: Embracing Radiation Protection Education and Safety Culture	Accra/Hybrid	10-13 October 22

Administration, Membership and & Meetings

Commission meetings

In the aftermath of the pandemic situation some Commission and Project Group meetings were held online and most were staged both online and onsite. This year the main Commission meetings focused on strengthening international collaboration (see above) apart from the current work on scientific drafts and fulfilling the administrative requirements.

ICNIRP Main Commission, Project Group (PG) and Executive Board (EBM) meetings

• ICNIRP PG LF Dosimetry	Online	8 September 22
• ICNIRP Ad-Hoc Commission Meeting	Online	14 September 22
• ICNIRP EBM	Online	21 October 22
• ICNIRP PG LF Dosimetry	Online	27 October 22
• ICNIRP PG UV	Online	2 November 22
• ICNIRP Annual General Meeting	Rome/Hybrid	7-8 November 22
• ICNIRP IRPA Collaboration Meeting	Rome/Hybrid	7 November 22
• ICNIRP PG RF Knowledge Gaps	Rome/Hybrid	7 November 22
• ICNIRP PG SWL	Rome/Hybrid	8 November 22
• ICNIRP PG LF Guidelines	Rome/Hybrid	8 November 22
• ICNIRP PG Ultrasound	Rome/Hybrid	7-9 November 22
• ICNIRP EBM	Online	24 November 22
• ICNIRP EBM	Online	20 January 23
• ICNIRP Ad-Hoc Commission Meeting	Online	1 February 23
• ICNIRP EBM Secretariat Communication Meeting	Online	2 March 23

• ICNIRP Ad-Hoc Commission Meeting	Online	5 April 23
• ICNIRP EBM	Online	26 April 23
• ICNIRP EBM	Online	14 June 23
• ICNIRP Commission Meeting	Munich/Hybrid	25 June 23
• ICNIRP PG ENV	Munich/Hybrid	25 June 23
• PG LF Guidelines	Munich/Hybrid	26 June 23
• ICNIRP PG UV	Munich/Hybrid	26-27 June 23
• ICNIRP PG RF Knowledge Gaps	Munich/Hybrid	27 June 23

Governance

Declaration of personal interests (DOI)

The declarations of personal interests are completed by all Commission and SEG members on a yearly basis. The declarations of personal interests are screened and evaluated by the Board and Commission with the objective of safeguarding ICNIRP's scientific independence. All declarations of personal interests are available on the ICNIRP website at www.icnirp.org. The DOI form introduced in 2021 which allows for a more formalized and transparent screening with the evaluation results being publicly available has been well received and its use is continued.

Budget

ICNIRP funding stems from public and governmental agencies only. In 2022 the ICNIRP activities were supported by the German Federal Ministry for the Environment (BMU), the European Union Programme for Employment and Social Innovation ("ESF-PJG"), and the International Radiation Protection Association (IRPA). In addition, the Ministry of Health of New Zealand (NZ MoH) and the Australian Radiation Protection and Nuclear Safety Authority (ARPANSA) also provided a general subsidy. This year additional support was received from the Nagoya Institute of Technology, Japan for the organization of the mini-symposium and meetings in Nagoya, Japan.

Financial Report 2021 - Amounts in Euro		
Income		
Subsidies*		78.787,25
Workshops and Books		487,31
Total Income		**79.274,56**
Expense		
Staff & Training	- 96.257,67	
Meetings & Workshops	- 360,00	
Publications & Communication	- 4.359,84	
Insurance & Administrative Expense	- 2.209,68	
Total Expense	**103.187,19**	

Finance Income		0,00
Finance Costs	- 330,79	
Financial results	**- 330,79**	
Result of the Year	**-24.243,42**	

Financial Report 2022 - Amounts in Euro		
Income		
Subsidies*		120.747,80
Workshops and Books		435,17
Total Income		**121.182,97**
Expense		
Staff & Training	- 95.926,46	
Meetings & Workshops	- 25.722,01	
Publications & Communication	- 8.866,52	
Insurance & Administrative Expense	- 2.726,52	
Total Expense	**- 133.241,51**	
Finance Income		0,00
Finance Costs	- 339,21	
Financial results	**- 339,21**	
Result of the Year	**- 12.397,74**	

* Funded in part by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or its granting authority. Neither the European Union nor the granting authority can be held responsible for them.