ICNIRP
INTERNATIONAL COMMISSION ON
NON-IONIZING RADIATION PROTECTION

ICNIRP ACTIVITIES

ANNUAL REPORT 2024

This report summarizes the activities of the Commission for the period between 1st January 2024 and 31st December 2024.

Science

Work Plan Activities

ICNIRP through a range of project groups is developing statements and guidelines providing important outputs which will contribute to improve 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. The PG produced a final draft document which was finalized by the Commission and approved for publication in Health Physics at the End of 2024.

The ICNIRP Statement: Gaps in Knowledge Relevant to the "Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (100 kHz to 300 GHz)" (Health Phys 128(2):190–202; 2025) is available here.

Revision of the Statement on Laser Pointers

The Project Group on "Laser Pointers" 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. The project was re-launched under the leadership of Dr Nigel Cridland following the discussion on the new Work Plan at the Annual General Meeting 2024.

Short Wavelength Light and Circadian Rhythm

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

Concerns have been raised about the possibility of effects from exposure to short wavelength light (SWL), defined here as 380 – 550 nm, on human health. The spectral sensitivity of the human circadian timing system peaks at around 480 nm, much shorter than the peak sensitivity of daytime vision (i.e., 555 nm). Some experimental studies have demonstrated effects on the circadian timing system and on sleep from SWL exposure, especially when SWL exposure occurs in the evening or at night. ICNIRP has identified a lack of consensus among public health officials regarding whether SWL from artificial sources disrupts circadian rhythm, and if so, whether SWL-disrupted circadian rhythm is associated with adverse health outcomes. Systematic reviews of studies designed to examine the effects of SWL on sleep and human health have shown conflicting results. There are many variables that can affect the outcome of these experimental studies. One of the main problems in earlier studies was the use of photometric quantities as a surrogate for SWL exposure. Additionally, the measurement of ambient light may not be an accurate measure of the amount of light impinging on the intrinsically-photosensitive retinal ganglion cells, which are now known to play a major role in the human circadian timing system. Furthermore, epidemiological studies of long-term effects of chronic SWL exposure per se on human health are lacking. ICNIRP recommends that an analysis of data gaps be performed to delineate the types of studies needed, the parameters that should be addressed, and the methodology that should be applied in future studies so that a decision about the need for exposure guidelines can be made. In the meantime, ICNIRP supports some recommendations for how the quality of future studies might be improved.

The ICNIRP Statement on Short Wavelength Light Exposure from Indoor Artificial Sources and Human Health (Health Phys 126(4):241–248; 2024) was published and is available here.

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 and after an exploratory phase it was consolidated in 2024. It will develop its drafts mainly via hybrid collaboration and at meetings held in conjunction with the commission meetings.

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 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. The project was re-launched at the Annual General Meeting 2024 following the discussion on the new Work Plan. The Project Group was set up under the leadership of Dr Ilko Ilev. The Project Group is expected to start in the course of 2025.

Revision of the LF Guidelines (≤10 MHz)

A Project Group under the leadership of Dr Ken Karipidis 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). The Project Group will not review the dosimetry literature covered by a separate Project Group (low frequency dosimetry). Three sub-groups (human experimental, epidemiology, in-vivo/in vitro/in silico) were launched with the aim of producing single reviews to be published separately. Their conclusions will be integrated in an annex of the LF guidelines at a later stage.

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 and to develop a draft. The work is done in conjunction with the above-mentioned PG LF.

Exposure to Airborne Ultrasound

A Project Group, under the leadership of Dr Ken Karipidis, was 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. The Project Group has now finalized its work and ICNIRP published the related Statement in Health Physics.

Cleaning, drilling, welding and emulsifying, burglar alarms, pest repellent, remote controls, compressors, pneumatic tools, and high-speed machinery have in common the use of airborne ultrasound. Indeed this is used for various purposes both in industrial and public settings and is also often produced, unintentionally as by-products, by many sources. The International Radiation Protection Association (IRPA) published interim guidelines on limiting human exposure to airborne

ultrasound in 1984, based on the limited scientific evidence that was available at that time. Research since the IRPA guidelines has made some improvements in the knowledge base but there are still significant data gaps that need to be resolved, including research needs related to health outcomes and an improved dosimetry. In its newest statement ICNIRP makes a number of recommendations for future research on airborne ultrasound.

The ICNIRP Statement "Validity of the 1984 Interim Guidelines on Airborne Ultrasound and Gaps in the Current Knowledge" was published at Health Physics (Health Phys 127(2):326-347; 2024) and is available here.

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 exploratory phase, the PG is working via online and onsite meetings and electronic exchanges to advance the project.

Communication and Publications

Website & Newsletter

ICNIRP communicates its activities mainly via its website where it provides all its Journal publications and notes in open access. The website is also where the ICNIRP news are communicated in regards to membership changes and notifications of calls addressed to the radiation protection community in Europe and worldwide. ICNIRP sends newsletters to those registered on the basis of the topic selected.

Social Media

Communication via Social Media gaining more attention ICNIRP decided to develop its presence on the LinkedIn platform. This media was identified as the most appropriate to convey the ICNIRP messages to the radiation protection community allowing also to reach the interested public not specialized in radiation protection issues with the best level of factual professionality.

Publications activities

ICNIRP Statements

ICNIRP Statement on Short Wavelength Light Exposure from Indoor Artificial Sources and Human Health. Health Phys 126(4):241–248; 2024. It is available here.

ICNIRP Statement “Validity of the 1984 Interim Guidelines on Airborne Ultrasound and Gaps in the Current Knowledge.” Health Physics (0):10.1097/0000000000001800; May 20; 2024. It is available here.

ICNIRP Statement: Gaps in Knowledge Relevant to the "Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (100 kHz to 300 GHz)” (Health Phys 128(2):190–202; 2025) is available here.

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.

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.

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:

- IRPA 16 Congress — Orlando, USA — 7-12 Jul 24
  Theme: International Radiation Protection System

Participation of ICNIRP representatives in Workshops, Scientific Meetings and Courses

- ICRP SLO Meeting — Bristol — 26-28 Sept. 23
- ESA Solaris Conference
  Theme: International Conference on Energy from Space 2024, Royal Aeronautical Society — London — 17 April 24
- ITU Workshop
  Theme: EMF Harmony: Balancing Connectivity and Safety in the Arab Region — Oman/Hybrid — 13-16 May 24
- WHO IAC Meeting — Geneva/Hybrid — 11-13 June 24
- ICRP Special Liaison Organizations Meeting — Munich — 10 September
- WHO Seminar - World Patient Safety Day — Online — 17 September
- GSMA EMF Forum — Brussel/Online — 1 October
- National Workshop about the health impact assessment for electromagnetic field exposure — Croatia/Online — 1 & 9 October
- GLORE Meeting — Online — 29 October

Scientific & Administrative 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 and Project Group (PG) meetings

- ICNIRP Ad-Hoc Commission Meeting — Online — 16 January 24
- ICNIRP EBM — Online — 22 January 24
- ICNIRP Ad-Hoc Commission Meeting — Online — 31 January 24
- ICNIRP Ad-Hoc Commission Meeting — Online — 15 February 24
- ICNIRP PG LF Dosimetry — Online — 5 April 2024
- ICNIRP EBM — Online — 12 April 24

• ICNIRP EBM	Online	02 May 24
• ICNIRP EBM	Online	24 May 24
• ICNIRP Secretariat Meeting	Online	10 June 24
• PG UV	Munich/Hybrid	15 July 24
• ICNIRP Annual General Meeting	Munich/Hybrid	16-17 July 24
• ICNIRP PG LF Guidelines	Munich/Hybrid	17-18 July 24
• ICNIRP PG ENV	Munich/Hybrid	18 July 24
• ICNIRP EBM	Online	31 July 24
• ICNIRP PG Launch Preparation	Online	18 October
• ICNIRP EBM	Online	21 October
• ICNIRP PG LF Dosimetry	Online	5 November
• ICNIRP Commission Meeting	Online	12 & 18 November
• ICNIRP PG LF	Online	14 November

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.

Financial Support

ICNIRP funding stems from public and governmental agencies only. In the reporting period the ICNIRP activities were supported by the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), the European Union*, 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. Additional support was also received from the Nagoya Institute of Technology, Japan, from the Japanese National Institute for Communication Technology (NICT), and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) via direct partial covering of travel expenses of Commissioners.

Financial Report 2023 - Amounts in Euro		
Income		
Subsidies*		169.256,94
Workshops and Books		209,88
Total Income		**169.466,82**
Expense		
Staff & Training	- 99.439,90	
Meetings & Workshops	- 40.084,79	
Publications & Communication	- 5.357,14	
Administrative Expense	- 5.276,87	
Total Expense	**- 150.158,70**	
Finance Income		0,00
Finance Costs	- 345,46	
Financial results	**- 345,46**	
Result of the Year	**18.962,66**	

Financial Report 2024 - Amounts in Euro		
Income		
Subsidies*		140.608,90
Workshops and Books		414,70
Total Income		**141.023,60**
Expense		
Staff & Training	- 106.947,50	
Meetings & Workshops	- 26.080,10	
Publications & Communication	- 13.564,20	
Administrative Expense	- 4.325,40	
Total Expense	**- 150.917,20**	
Finance Income		0,00
Finance Costs	- 334,90	
Financial results	**- 334,90**	
Result of the Year	**- 10.228,10**	

* 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.