



Third European IRPA Congress

NSFS

Radiation protection – science, safety and security

14 – 18 June 2010
Helsinki, Finland
www.irpa2010europe.com



SECOND ANNOUNCEMENT
and Call for Abstracts

Welcome to European IRPA 2010

Dear colleagues from all over Europe and beyond

The Nordic Society for Radiation Protection (NSFS) has the honour to invite you to the regional European IRPA Congress in Helsinki in 14–18 June, 2010. This is the third European IRPA congress. The two preceding congresses in 2002 and 2006 were held in Florence, Italy and in Paris, France. The Nordic society represents all five Nordic countries, Denmark, Finland, Iceland, Norway and Sweden, and it also has members from the Baltic States. The Nordic radiation protection experts and authorities will arrange a congress covering all radiation protection topics and offering an opportunity for high-level and open discussion about the latest findings in radiation research and challenges in radiation safety and security. Helsinki and its long, bright mid-summer days open up an excellent setting for the congress.

The congress slogan "Radiation protection – science, safety and security" expresses the tight connection between these cornerstones in striving to achieve high level radiation protection. Our aim is to provide an overview of the international state of the art of the radiation protection system for ionising and non-ionising radiation and organise thematic sessions on the latest developments in the field. We are pleased to invite professionals from all over Europe and beyond to give their contribution to the program.

Science Safety Security Radiation Protection

An International Organisations Forum will give an overview over the latest standards and developments regarding various aspects of radiation protection. IAEA, ICRP, ICNIRP, EC, WHO, OECD/NEA, ICRU and UNSCEAR will be represented. Plenary sessions with keynote speakers will further highlight major advancements in science, safety and security.

Several scientific and technical sessions deal with current topical issues in more detail. Each session features an invited speaker giving an introduction to the field, and selected oral contributions of general interest. Poster sessions provide an opportunity for discussion and networking. Moreover, refresher courses given by recognised experts offer professional training in radiation protection.

Associated Societies Forum will bring together the European societies to discuss current professional issues and themes on international collaboration.

Visit www.irpa2010europe.com to find more information on the third European IRPA Congress.

We look forward to meeting you in Helsinki in 2010.



Lars-Erik Holm
Congress president



Sigurður Magnússon
President of NSFS



Sisko Salomaa
Chair of the scientific programme committee



Raimo Mustonen
Chair of the local organising committee

Welcome to Helsinki, Finland

Finland is one of the most popular congress countries in the world. The country's beautiful nature, its tidy towns and unpolluted environment, its versatile culture and friendly people make it an ideal venue for international events. Finland is a member of the European Union and uses the common currency, Euro. Finland is also one of the Schengen countries.

Helsinki – a recognised congress city

Helsinki is well-equipped to arrange large meetings. Over the past decades Helsinki has gained a reputation as an interesting, safe and clean host town of numerous international congresses. Helsinki is large enough to provide all the services that a major congress may require, yet small enough to make delegates and their families feel at home during their stay.

Congress venue, Finlandia Hall

The congress will be held at Finlandia Hall, which is one of the leading concert and congress venues in Helsinki, designed by the world-renown architect Alvar Aalto. Finlandia Hall has hosted numerous international meetings of world-wide importance. It is ideally situated in a beautiful park in the very heart of the city, a short walking distance from the major hotels and sightseeings (see the location map on the last page).



Finlandia Hall and its Congress Wing

Organisation and committees

Congress president

Lars-Erik Holm

Scientific programme committee

Chair Sisko Salomaa

Scientific secretariat

Tua Rahola
Oleg Belyakov

Members

Andor Andrasi, Hungary
Mikhail Balonov, Russia
Ritva Bly, Finland
Michel Bourguignon, France
Borut Breznik, Slovenia
Andrej Bushmanov, Russia
Marie Claire Cantone, Italy
Zhanat Carr, WHO
John Croft, United Kingdom
Renate Czarwinski, IAEA
Yuri Franken, The Netherlands
Norman Gentner, UNSCEAR
Oscar Gonzalez Corral, Spain
Klaus Henrichs, Germany
Augustin Janssens, EC
Jukka Juutilainen, Finland
Pierre Kockerols, Belgium
Rima Ladygiene, Lithuania
Ted Lazo, OECD/NEA
Bernard Le Guen, France
Sigurður Magnússon, Iceland
Irena Malatova, Czech Republic
Franz Josef Maringer, Austria
Constantin Milu, Romania
Herwig Paretzke, ICRU
J. J. F. Quintela De Brito, Portugal
Maria Ranogajec-Komor, Croatia
Seppo Soimakallio, Finland
Dina Solatie, Finland
Per Strand, Norway
Jens Søgaard-Hansen, Denmark
Harri Toivonen, Finland
Jack Valentin, ICRP
Paolo Vecchia, ICNIRP
Eva Wallström, Sweden
Mette Øhlenschlaeger, Denmark

Local organising committee

Chair Raimo Mustonen

Secretary general

Wendla Paile

Technical secretariat

Samu Inkinen
Nina Sulonen

Members

Ritva Havukainen, Finland
Tarja K. Ikäheimonen, Finland
Carsten Israelson, Denmark
Hannu Järvinen, Finland
Mika Kortnesniemi, Finland
Päivi Kurttio, Finland
Markku Koskelainen, Finland
Virpi Launonen, Finland
Bent Lauritzen, Denmark
Jarmo Lehtinen, Finland
Carl-Göran Lindvall, Sweden
Mika Markkanen, Finland
Maarit Muikku, Finland
Sigurður Emil Pálsson, Iceland
Veli Riihiluoma, Finland
Raija Seuri, Finland
Pia Vesterbacka, Finland
Olli Vilkkamo, Finland
Tor Wøhni, Norway

Liasions committee

Chair Jorma Aurela, Finland

Members

Magnus von Bonsdorff, Finland
Carl-Gustaf Standertskjöld-Nordenstam, Finland

Grants committee

Chair Klaus Henrichs, Germany

Members

Hielke Freerk Boersma, The Netherlands
Bernard Le Guen, France
Irena Malatova, Czech Republic
Franz-Josef Maringer, Austria
Dina Solatie, Finland

Contributing organisations

IRPA – International Radiation Protection Association
 NSFS – Nordic Society for Radiation Protection
 STUK – Radiation and Nuclear Safety Authority, Finland
 SSM – Swedish Radiation Safety Authority
 NRPA – Norwegian Radiation Protection Authority
 SIS – National Institute of Radiation Protection, Denmark
 GR – Icelandic Radiation Protection Institute
 NKS – Nordic Nuclear Safety Research
 Radiological Society of Finland
 EC – European Commission
 IAEA – International Atomic Energy Agency
 OECD/NEA – Organisation for Economic Co-operation and Development/Nuclear Energy Agency
 WHO – World Health Organization
 UNSCEAR – United Nations Scientific Committee on the Effects of Atomic Radiation
 ICRP – International Commission on Radiological Protection
 ICNIRP – International Commission on Non-Ionizing Radiation Protection
 ICRU – International Commission on Radiation Units and Measurements



Photos: p. 4 – 5; Finlandia Hall image Bank /Matti Tirri, p. 6 – 7; stock.xchange

Call for abstracts

Abstracts for oral and poster presentations should be submitted by **15 September 2009**. The authors will receive notification of acceptance by 15 December, 2009. Submission of full papers is requested by 15 April, 2010.

Only presentations of registered participants with paid registration fee will be included in the programme. The final programme will be available at the congress website on 15 May, 2010. The congress material will include the programme, book of abstracts and CD-ROM proceedings of full papers. Poster presentations will be available throughout the congress.

Submission of abstracts, full papers and posters takes place electronically via European IRPA website www.irpa2010europe.com. Please indicate the topical area for your presentation and the author presenting. Further instructions for preparation of abstracts, full papers and posters will be presented on the website.

Congress topics

Radiation detection technologies

Radionuclide analytics

Dosimetry

Biological effects of ionising radiation

Health effects of ionising radiation

Radiation protection recommendations, standards and regulations

Radiation protection of workers

Radiation protection of patients

Radiation protection of the public

Radiation in the environment

Radiation protection of biota

Natural radiation, radon, NORM

Nuclear and radiological emergencies and incidents

Nuclear security and malevolent use of radiation

Medical response in radiation accidents

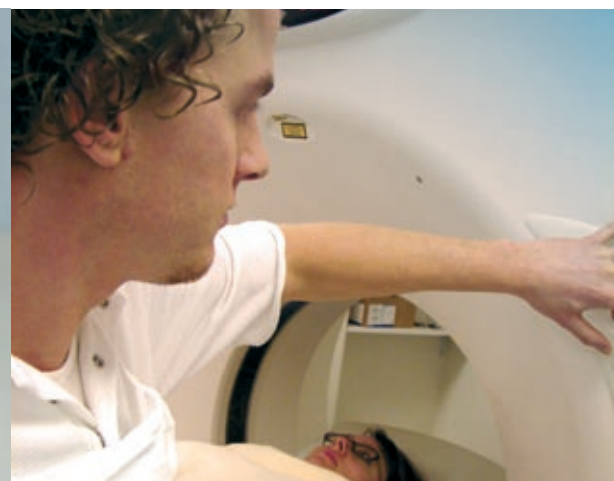
Non-ionising radiation protection

Decommissioning

Waste management

Radiation and the society

Education, training and RP culture



Programme outline

The scope of the program is broad, covering all fields of ionising and non-ionising radiation, ranging from detection methods and dosimetry to societal issues. Biological and health effects of ionising radiation focus on low dose risk, and presentations on topics like non-cancer effects and individual sensitivity are foreseen.

In line with the new ICRP recommendations, **the program includes the three main categories of exposure situations: planned, emergency and existing exposures**. Special areas of interest in the **patient protection domain** are e.g. medical exposure of pediatric patients, PET (PET/CT), justification applied to individual patients, radiation protection in radiotherapy, clinical audits, and new medical techniques. Justification, optimisation and ethics are always in focus.

As for **emergency situations**, recent efforts to improve security include prevention of illicit trafficking, security of sealed sources and security at major public events. New technological opportunities that help improve safety and aid law enforcement personnel dealing with such situations are described. Learning from recent accidents will help to mitigate similar incidents in the future.

Natural radiation in the environment, like radon, may cause major public exposure and require immediate mitigation actions. Also naturally occurring radioactive substances in various raw materials (NORM) and industrial by-products and wastes often call for radiation protection actions. NORM materials may need special attention e.g. in mining, milling or processing of various natural materials, as also in oil and gas production. Reports on experiences concerning the new framework for radiation protection of the biota are encouraged.

The importance of **non-ionising radiation** protection is increasing along with the number of electronic devices and wireless communication used in modern society. In addition, occupational exposure to magnetic fields in magnetic resonance imaging is an important topic in this congress.

The programme includes **two specialist workshops**, one on safe and effective use of radiation in health care and another on radiation protection issues in nuclear industry.

Tentative list of refresher courses

- External dosimetry and individual monitoring
- Internal dosimetry and individual activity assessment
- Radioecology and environmental exposure pathway
- Natural radiation environment and NORM
- Radiation protection metrology: instrumentation, uncertainty, traceability
- Emergency preparedness and response
- Stakeholder involvement and engagement
- Decommissioning and waste management
- Management of exposure from radon
- Optimisation of protection in medical exposures (CT and pediatric dosimetry)
- Radiation biology and health effects
- Radiation epidemiology
- Non-ionising radiation
- Cosmic radiation and air crew dose assessment
- ICRP 103 and beyond
- Radiation protection in high dose medical procedures



Tentative programme

	13 Sunday June	14 Monday June	15 Tuesday June
8:00			Refresher courses 3 – 6 (four parallel lectures)
8:30			
9:00		NOTE WORKSHOP: Implications of non- targeted effects for radiation protection	Opening ceremony
9:30		RADON WORKSHOP in Tampere	IRPA history / Geoffrey Webb
10:00		TECHNICAL VISIT at Olkiluoto EPR and geological repository for high level nuclear waste	
10:30			Coffee
11:00			Registration desk opens
11:30			Plenary lectures 1 – 3 (each 20 min) Highlights in European radiation protection
12:00			Refresher courses (1 – 2 in parallel)
12:30			Lunch
13:00			
13:30			Plenary lectures 4 – 6 (each 20 min) Highlights in European radiation protection
14:00			
14:30			Coffee / Technical exhibition
15:00	Technical visit		OPTIONAL TOUR:
15:30	Travel to Olkiluoto by bus		Helsinki by sea
16:00			Visit to Suomenlinna Fortress
16:30			International Organisations Forum
17:00			Poster session
17:30			
18:00			
18:30			Young scientists get together at Suomen- linna
19:00	Accommodation and sightseeing in Rauma		Reception and concert at Finlandia Hall
19:30			
20:00			
20:30			

16 Wednesday June			17 Thursday June			18 Friday June			
Refresher courses 7 – 10 (four parallel lectures)			Refresher courses 11 – 13 (three parallel lectures)			Refresher courses 14 – 16 (three parallel lectures)			8:00
									8:30
Biological effects of ionising radiation	Radiation detection technologies Radionuclide analytics	Radiation protection recommendations, standards and regulations	Radiation protection of the biota	Medical use of radiation	Nuclear and radiological emergencies and incidents	Non-ionising radiation protection	Waste management	Radiation and the society	9:00
									9:30
									10:00
Coffee / Technical exhibition			Coffee / Technical exhibition			Coffee / Technical exhibition			10:30
Poster session									11:00
Health effects of ionising radiation	Dosimetry	NORM	Radiation in the environment	Radiation protection of patients	Nuclear security and malevolent use of radiation	Non-ionising radiation protection	Decommissioning	Radiation and the society	11:30
Lunch			Lunch			Summaries			12:00
						Young scientist award			12:30
						Closing			13:00
									13:30
Associated Societies Forum	SPECIALIST WORKSHOP I Safe and effective use of radiation in health care	SPECIALIST WORKSHOP II Radiation protection issues in nuclear industry	Radon	Radiation protection of workers	Medical response in radiation accidents				14:00
Coffee / Technical exhibition			Coffee / Technical exhibition						14:30
									15:00
Poster session									15:30
Associated Societies Forum	SPECIALIST WORKSHOP I Safe and effective use of radiation in health care	SPECIALIST WORKSHOP II Radiation protection issues in nuclear industry	Radon	Radiation protection of the public	Education and training				16:00
									16:30
									17:00
									17:30
									18:00
									18:30
Reception by City of Helsinki at Town Hall									19:00
									19:30
			Congress dinner at Hotel Hilton Kalastajatorppa						20:00
									20:30

— Young scientist award

Ensuring competence in the field of radiation safety requires the education and encouragement of qualified professionals and trainees. The promotion of young scientists is therefore of high importance for the European IRPA societies. For this purpose the societies participating in the organisation of the congress offer an award for the best scientific or professional contribution(s). The award will carry remuneration.

National societies will be responsible for the nomination of their candidates; they are expected to support the participation of the candidates in the conference.

The abstract must be submitted to the programme committee of the congress before **November 1, 2009**; the abstract must be accompanied by a CV and an explanatory statement of the nominating society. If accepted, the presentation will be integrated into the scientific programme and a jury will elect the award winning contribution. The jury is free to award more than one contribution.

Details for the procedure are currently being developed by the contributing societies. For inquiries contact the chairman of the Grants committee, Klaus Henrichs, via e-mail: fs-sek@fs-ev.de

— Social programme, excursions and satellites

For the first day of the congress, **Monday 14 June**, there are several optional programmes. You can choose one of these:

A Visit to Olkiluoto 3, VLJ repository and ONKALO

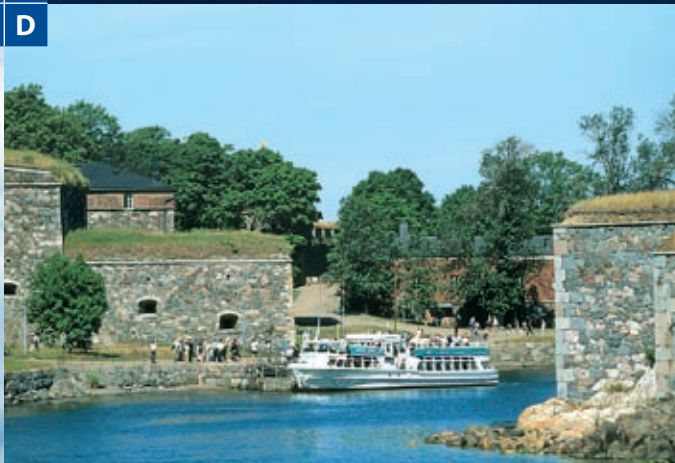
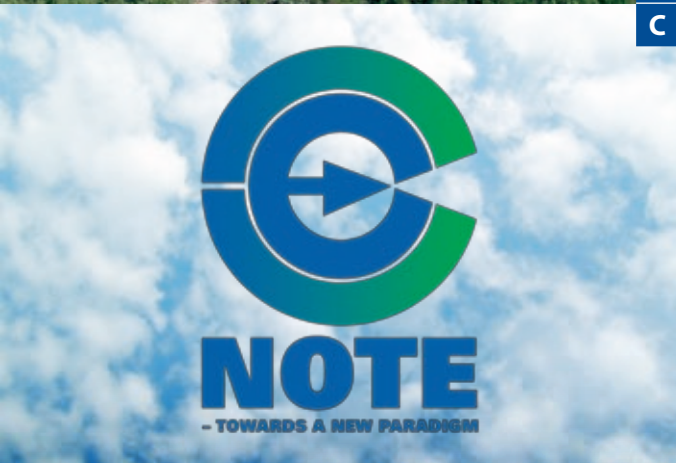
Olkiluoto is situated 250 km from Helsinki. There are two nuclear power plants in operation (Olkiluoto 1 and 2), and one new EPR (Olkiluoto 3), a French-German-Finnish co-project, is under construction. There is also a VLJ repository for low and intermediate radioactive waste. In addition, an underground research facility, ONKALO, is being built to confirm the suitability of the bedrock at Olkiluoto for final disposal of spent nuclear fuel. Transport from Helsinki is arranged by bus on Sunday afternoon, June 13 at 15:00. Evening and night is spent in Rauma, a small medieval town nearby, which is worth a visit in its own right. The picturesque wooden part, Old Rauma, is inscribed on the UNESCO World Heritage List. A guided tour in Old Rauma is included. On Monday morning we continue to Olkiluoto. The visit includes presentations of Olkiluoto 3, VLJ Repository and Onkalo in the Visitor Centre as well as a guided tour by bus to the sites. Lunch and coffees are offered by TVO. We will be back in Helsinki at about 19. The cost for this visit, including transport and accommodation, is 130 €. The number of participants is limited. Please note that personal data and passport number must be provided in good time before the visit. Identity will be checked on site.

B Radon mitigation and prevention, visit to Tampere

The city of Tampere is situated 170 km from Helsinki, in an area with potentially very high indoor radon concentrations. We will visit sites where methods and results of mitigation in existing buildings can be demonstrated, as well as preventing indoor radon in construction of new buildings. Radon well is a special approach used widely in the area. We start by bus from Helsinki on Monday, June 14, at 9:00 and arrive in Tampere around 11. Lunch is enjoyed on board an old fashioned steam ship, cruising on a beautiful lake. Return to Helsinki is estimated at 18–19. The cost for the Tampere visit including transport and lunch cruise is 60 €. The number of participants is limited.



A	B
C	D



C NOTE workshop

“Non-targeted effects of ionising radiation” (NOTE) is an ongoing European Integrated project (2006–2010). The main objective of NOTE is to study non-targeted effects, in particular, bystander effects, genomic instability and adaptive response and how they might contribute to radiation risk assessment and radiation protection standards (for details, please see www.note-ip.org).

NOTE will organise a satellite workshop “Relevance of non-targeted effects for radiation protection” on Monday, June 14 at Finlandia Hall. The workshop brings together NOTE project partners, members of scientific and radiation protection communities, decision makers and general public. The main aim of the stakeholder workshop is to inform on project results and to consider what implications non-targeted effects might have on the system of radiation protection. A summary of the workshop conclusions will be presented at the IRPA congress.

Prior registration (free for congress participants) is required. More information will be available at the congress website in September 2009.

D Helsinki by sea and visit to Suomenlinna Fortress

We embark a sightseeing boat on Monday, June 14 at 15:00 for a two hour tour through the beautiful archipelago of Helsinki. An afternoon snack is served on board. The boat then brings us to Suomenlinna Fortress, an 18th century monument of military architecture, constructed on seven islands just off Helsinki. Suomenlinna is one of Finland’s most popular tourist attractions and is also a world heritage site of UNESCO. At the same time it is a suburb of Helsinki, with 850 people living in the renovated ramparts and barracks. We go for a one hour guided walking tour, ending at 18:00, after which you can stride around on your own or in good company. Be prepared for cobblestones and meadows – take comfortable shoes! You may even take a swim, though the sea may be chilly at the time. You can also have dinner in one of the restaurants. Regular ferry traffic then takes you back to the market place in 15 minutes. The cost for this tour is 30 €, covering the sightseeing boat, the snack on board and the guided tour. The rest is up to you.

An informal **get together for young scientists** will be arranged at Suomenlinna on Monday evening after the guided tour. Please keep yourself updated through the congress website.



Registration

Registration fees		
Congress fee	Until 1 March 2010	490 €
	After 1 March 2010	640 €
Congress dinner		50 €
Refresher course		30 €
Specialist workshops (I, II)		Free
Satellite event: Note workshop		Free
Satellite event: Radon excursion to Tampere		60 €
Visit to Olkiluoto		130 €
Helsinki by sea and visit to Suomenlinna Fortress		30 €
Accompanying person's fee		100 €

The congress fee includes

- Participation in all lectures and access to the exhibition area
- Congress bag including programme, book of abstracts and CD-ROM proceedings of full papers
- Admission to reception and concert on Tuesday
- Admission to Helsinki City reception on Wednesday
- Coffee in the exhibition area during the breaks

The accompanying person's fee includes reception and concert on Tuesday and Helsinki City reception on Wednesday. Registered accompanying persons are welcome to attend the congress dinner and other events at the same rates as congress participants.

Online registration will be opened on December 15, 2009. The registration forms will be available on the congress website under Registration.



Photos: p. 10: stock.xange, p. 11: TVO (A), Finnish Tourist Board's Image Bank (B), STUK (C), City of Helsinki Picture Bank / Comma Image Oy (D), p. 12: Dreamstime, p. 13: Crown Plaza Hotel Image Bank

— Payment and cancellation policy

Currency and methods of payment

Payments should be made in euros (€) either by bank transfer against invoice or by credit card (only VISA, MasterCard or EuroCard are accepted). No cheque payments are accepted.

Cancellation of registration and hotel reservation

Cancellations will be accepted until March 31, 2010. The full amount will be refunded less 100 € to cover cancellation costs. No refunds will be made for cancellations received after this date. Cancellations must be made in writing by e-mail, fax or airmail to the congress secretariat. Reimbursement will not be given for late arrival, unused services, unattended events or early departure from the congress.

Changes

Changes of participants are accepted at any time at an extra charge of 30 €.

— Hotel accommodation

Contingents have been reserved for congress participants in the following hotels:

- Crowne Plaza
- Scandic Continental
- Scandic Simonkenttä
- Sokos Presidentti
- Hotel Helka
- Hostel Academica

All are within walking distance from the congress site. Booking for these hotels should be made through the congress secretariat in connection with registration for the congress. Further details will be published on the congress website.

There are other hotels within convenient distance as well, e.g. Hotel Arthur, Hotel Omena and Hostel Satakuntatalo. Many hotels offer special rates when booking on the web. If you prefer, you can make your own booking directly with the hotel. You should, however, book your accommodation in good time.

General information

Congress dates and language

The congress will take place on 14–18 June 2010. The official language is English.

Registration desk

The registration desk will be open at Finlandia Hall from Monday, June 14 at 11:00. The congress secretariat will be available at Finlandia Hall to assist you during the congress.

Technical exhibition

The exhibition area is located in the lobby areas of Finlandia Hall close to the lecture halls, meeting rooms and refreshment areas. Access to the exhibition is free for registered participants. The exhibition will be open throughout the meeting hours, 15–18 June 2010. A special invitation folder for exhibitors/sponsors is available on the website.

Coffee and refreshments

Coffee, tea and other refreshments are included in the congress fee and will be available in the exhibition area during the breaks.

Congress dinner

The congress dinner will take place at Hilton Kalastajatorppa, a first class hotel situated on the sea shore in a green parkland just 20 minutes by tram from Finlandia Hall. Welcome cocktail will be served in the lovely seaside garden. After enjoying a Nordic dinner you can admire the late sunset on a distant horizon while walking in the park.

Tourist information

Information about Helsinki can be obtained through the website of Helsinki www.hel.fi and Helsinki Expert office www.visithelsinki.fi

Climate and clothing

The weather in June is mostly sunny with only occasional rainy days. The daytime temperature is about +15–25°C. Evenings may be cooler, so it is advisable to bring some warm clothes with you. There are 20 hours of daylight, so you will have the opportunity to enjoy the exotic white nights typical of the Nordic countries this time of the year.

1 Finlandia Hall, the congress venue

2 Helsinki Hall, one of the congress auditoriums

3 Piazza, foyer of the main auditorium at Finlandia Hall

4 Tourist Info at North Esplanade in the city centre



Travel information

Flights to Helsinki-Vantaa airport

There are excellent flight connections to Helsinki. Several airlines provide direct flights to Helsinki from all over Europe as well as from countries outside Europe. Helsinki-Vantaa Airport has regularly been rated one of the world's best airports and is situated only 20 km (30 minutes) from Helsinki city centre.

Airport transportation

Finnair provides regular bus transportation between Helsinki-Vantaa Airport and the City Terminal near the railway station at a cost of approximately 6 €. Taxis between the airport and the city centre cost approximately 30–40 €. Group taxis are also available at the airport (Yellow Line and Airport Taxi, cost approximately 20 € per person).

Transportation by sea

An alternative route to Helsinki is by sea. Several cruise ships arrive each day from Stockholm and Tallinn right into the city centre. The sea voyage from Stockholm lasts overnight and the route from Tallinn only 1.5 to 3.5 hours. The beautiful seaside panorama to be admired on arrival explains why Helsinki has been named the Daughter of the Baltic Sea.



Letter of invitation

Upon request, the chairman of the congress will be pleased to send a personal letter of invitation so as to enable participants to obtain supporting funds or visas for attending the congress. These invitation letters cannot be considered as an offer of financial support by the organisers.

Visa and passports

EC citizens only need their national identification papers. Citizens from most other countries will need a valid travel passport. They are encouraged to contact their local Finnish embassy or consulate to enquire about the necessity of visa application. Passport is recommended for EC citizens especially if you plan to travel to Tallinn, Estonia. If you intend to visit Olkiluoto you must bring your passport.

Liability

By registering into the congress and/or by participating in the exhibition joined to the congress, participants and exhibitors agree that neither the organising committee nor the congress secretariat assume any responsibility for damage or injuries to persons or property during the congress. Participants and exhibitors are advised to organise their own health, travel and personal insurances.

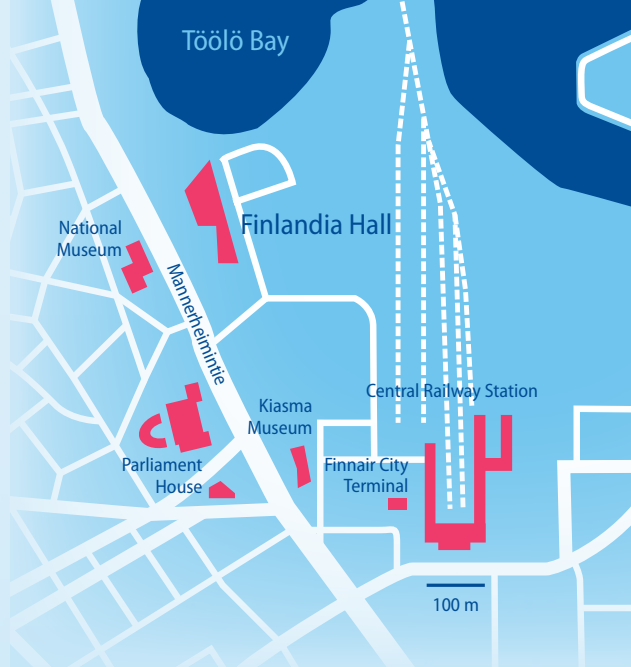


Location of Finlandia Hall

Street address: Mannerheimintie 13 e,
FI-00100 Helsinki, Finland
www.finlandiatalo.fi/en

Contact information

IRPA 2010 Congress Secretariat
CONGREX / Blue & White Conferences Oy
P.O.Box 81, FI-00371 Helsinki, Finland
Tel: +358 9 5607 500 ■ Fax: +358 9 5607 5020
Email: irpa2010europe@congrex.fi



Important dates and deadlines

Abstracts reception deadline	15 September 2009
Notification of acceptance	15 December 2009
Opening of online registration	15 December 2009
Early registration deadline	1 March 2010
Submission of full papers	15 April 2010
Final programme available at website	15 May 2010
European IRPA 2010 Congress	14 – 18 June 2010

