



IFRF ja toiminta Suomessa

Ville Hankalin
V IFRF Liekkipäivä

14. tammikuuta 2009

Dipoli-talo

Espoon Otaniemi

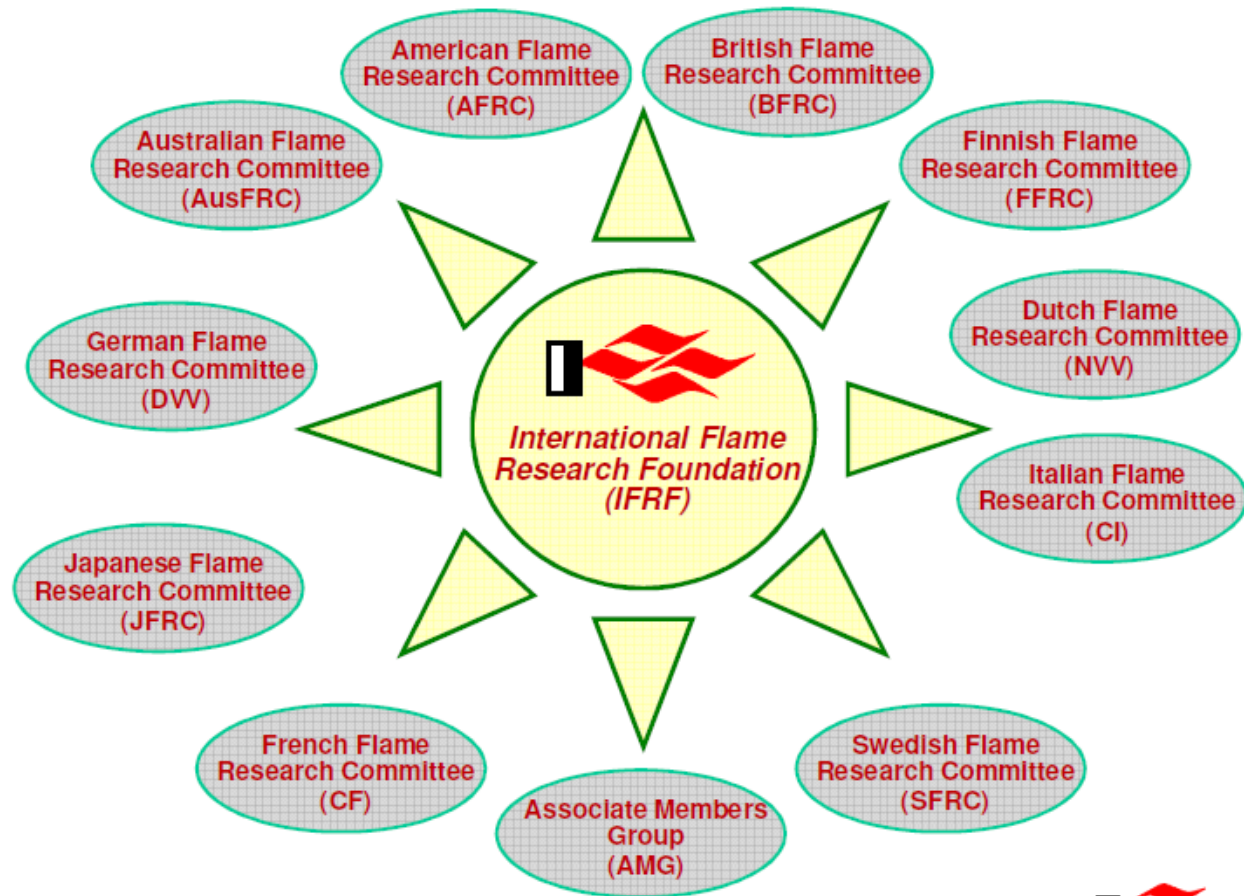
IFRF ja toiminta Suomessa

- Mikä on IFRF
- Toiminta ja tutkimus
- Tapahtumia
- IFRF Suomessa
 - Jäsenet
 - Toiminta

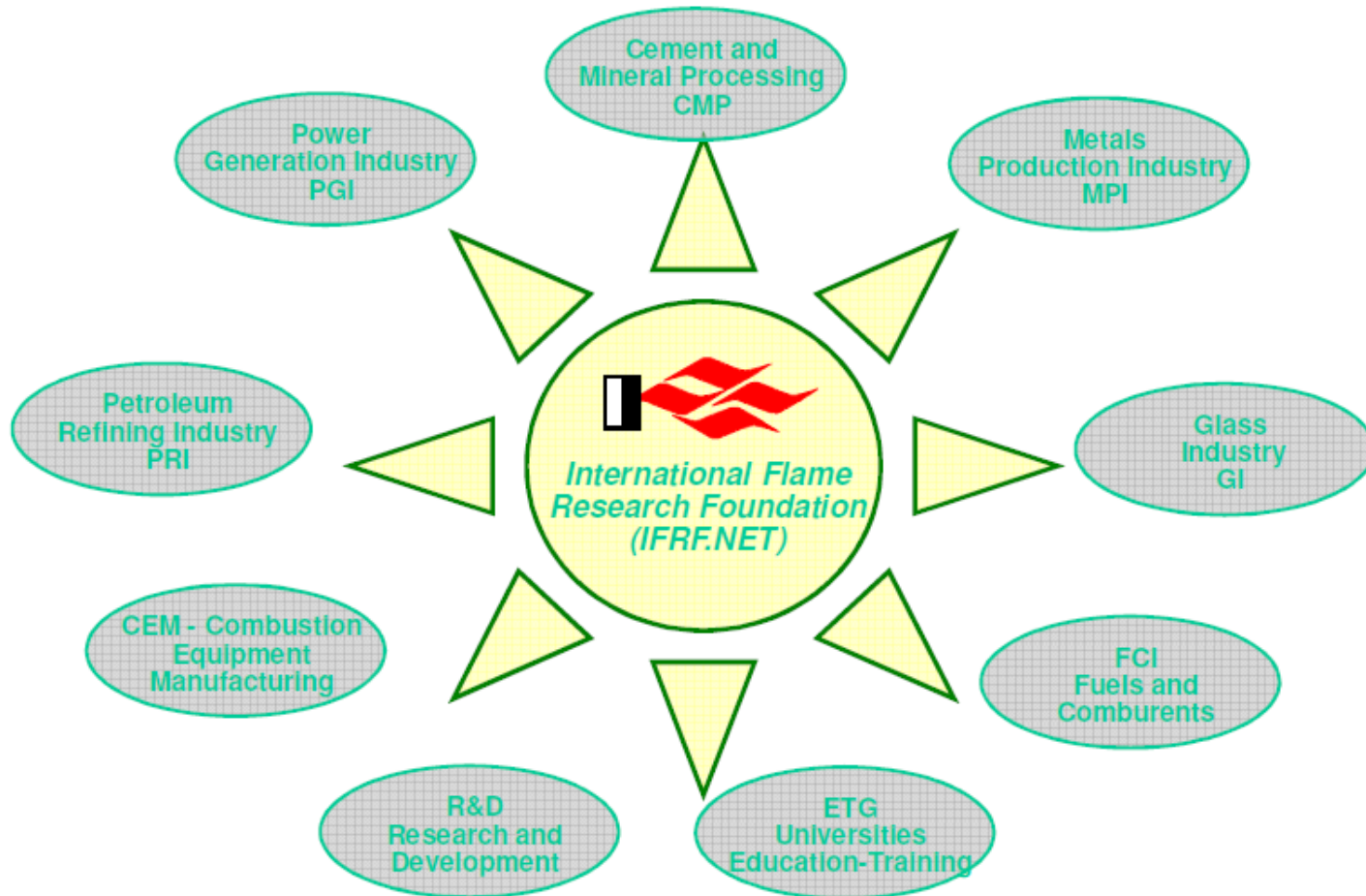


IFRF – polton alan verkosto

IFRF is a
Network of
Combustion
Related
People
Around
1500 people
in 23
countries

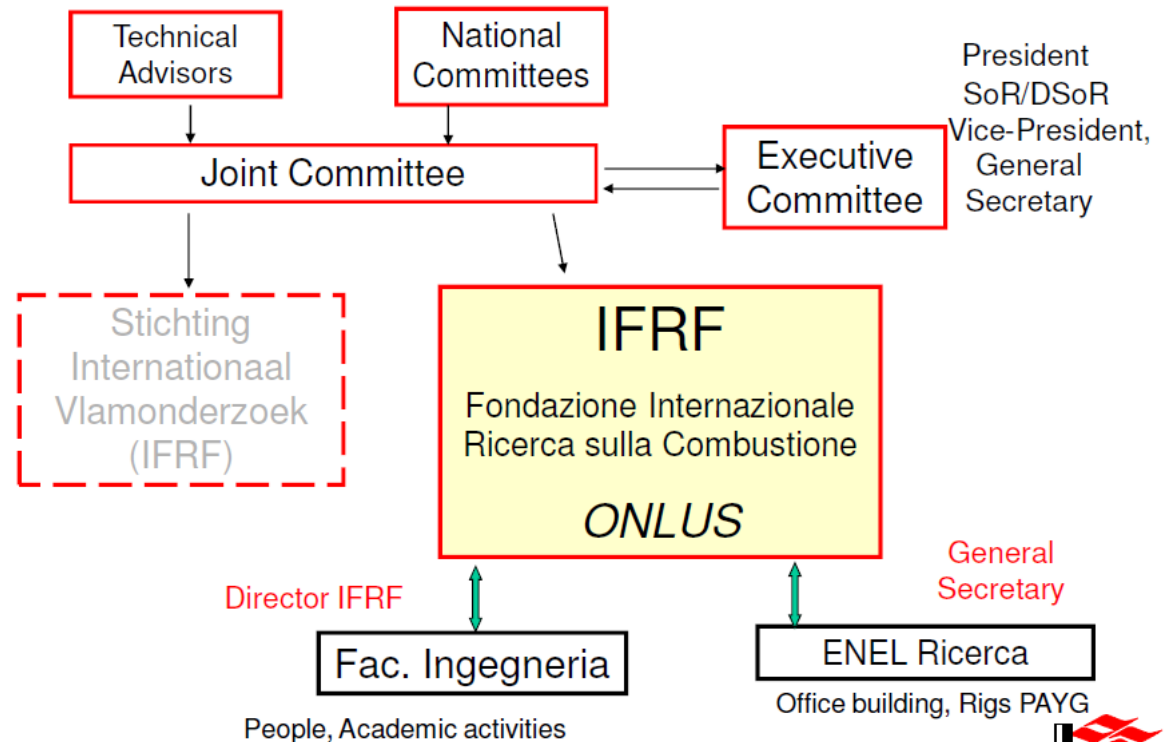


IFRF – sektorit



IFRF - järjestö

- Kansainvälinen polttotekniikan tutkimusjärjestö
- Perustettu vuonna 1948
- Voittoa tavoittelematon järjestö (ONLUS)



IFRF – Executive Committee

- President: **Dr. Richard Waibel** John Zink Co., USA
- Vice President: . **Mr. Jacques Duguè**, TOTAL, France
- General Seretary: **Dr. Gennaro De Michele**, ENEL Ricerca, Pisa, Italy
- Superintendent of Research: **Prof. Helmut Spliethoff**, Technical University of Munich, Germany
- JC Representative: **Dr. Susumo Mochida**, Nippon Furnace Co., Japan
- Deputy Superintendent of Research: **Dr. Neil Fricker**, Glamorgan University, UK

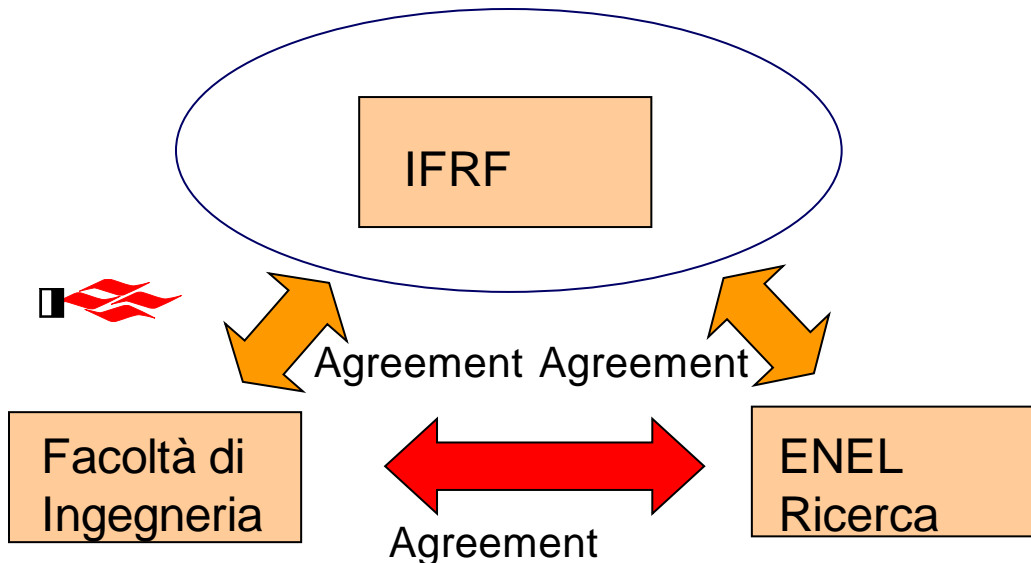


IFRF – agenda

- Act as a **facilitator for cooperative projects** with or between members and promote **networking activities** (EFRI)
- Promote, execute and report **Members' Research Programme (MRP)**
 - Pursue and report current **ENEL funded projects**
 - Pursue and develop **CFD (sub) modelling verification and validation** criteria and procedures
 - Pursue and disseminate **coal and solid fuel combustion characteristic** through IFRF **SFDB**
- Reactivate **training/mobility** of investigators from industry on the MRP and through courses
- Collect and disseminate **combustion data and studies** through conferences, TOTeMs, workshops, web-based publications and archives

IFRF – sijainti

- Pääkonttori ja tutkimuslaitteet siirtyivät Livornoon, Italiaan v. 2006
- Hollannin IJmuiden v. 1948 – 2006



IFRF – henkilöstö Livornossa

- Johtaja professori Leonardo Tognotti, Pisa University
- Hallinto ja viestintä Tracey Biller
- 3 tutkijaa, 1 teknikko
- ENELin tutkimusaseman henkilökunta
 - 12 insinööriä ja teknikkoa
 - Jatko- & perusopiskelijat



IFRF – Research Capabilities

- IFRF has access to **test facilities of ENEL**, Livorno Research Station
- IFRF has access for **fixed periods to these state-of-the-art experimental facilities**, from lab to industrial scale
- The facilities are available for undertaking the **IFRF Members Research Programme and Members' test work**, and **on a confidential basis** as well



IFRF – Research Capabilities

- **FOSPER** (FOrnace SPERimentale) (*Furnace #1*)
- **Isothermal plug flow reactor (IPFR)**
- **500 KWT Furnace**
- **Atomisation rig/ spray characterisation**
- *Aerodynamic lab. for “cold” characterisation*
- *Optical Diagnostic lab.*
- **CASPER** (6.5 MWt boiler for liquid/gas burners)
- **CIRO** (100 kWt circulating fluidized)
- **SCR** (Catalytic Denitrifier 10-300 Ncm/h of flue gas)
- **Bagfilter, Electrostatic Precipitator**
- **SPLIT** (0.5-2 MWt gas turbine combustor, atmospheric)
- **Hitac/Flameless Combustors test rig**

IFRF – Members Research Programme

- MRP is a guideline to research that IFRF supports and conducts
 - Based on the inquiry in 2007
 - CFD modelling verification & validation
 - Solid fuel combustion characteristic & Solid Fuel Data Base (SFDB)



RESEARCH
REPORT

Livorno, June 2009
IFRF Doc No D 00/y/37

IFRF MEMBERS RESEARCH PROGRAMME AN AGENDA FOR 2010-2014

Hartmut Spliethoff¹, Neil Fricker²
and Leo Tognotti³

¹Superintendent of Research, Technical University of Munich, Germany

²Deputy Superintendent of Research, University of Glamorgan UK,

³Director, IFRF

<http://www.research.ifrf.net>

INTERNATIONAL FLAME RESEARCH FOUNDATION

REGISTERED o/o Presidenza Ingegneria, Via 56126, Pisa, Italy CF: 9305990506	OFFICE Facoltà di Diotisalvi 2, Pisa, Italy	OPERATIONS CENTRE Via Salvatore Orlando 5, 57123 Livorno, Italy	CONTACT NUMBERS Tel: +39 0586 891678 Fax: +39 0586 200045 e-mail: info@ifrf.net http://www.ifrf.net	BANK IBAN: IT 06 M 06200 14011 00000586187 Cassa di Risparmio Lucca Pisa Livorno Swift: BPALIT3LXXX VAT no.: 01607000508
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IFRF – www.ifrf.net

- Monday Night Mail & Events Calendar
- Combustion Handbook
- Combustion Journal
- Research Reports
- SFDB
 - Available online in early 2010

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Welcome to IFRF Online

www.ifrf.net

The IFRF - International Flame Research Foundation, an international centre of excellence for combustion research, technology and information.

About us	Research Facilities	Members Research
Who we are Office Holders Member Organisations Our history Visit us Contact us		Current reports Programmes Search Special programmes
Industrial Combustion	The Monday Night Mail	Combustion Handbook
Aims and scope Latest papers List of papers Editorial board Propose a paper Management	What is it? Latest Edition Search Archive	Glossary New Combustion Files Filing System Search Combustion Files
Conferences, TOTeMs and Workshops	Events Calendar	Library
Overview Search		Search Document Archive
Members' Exchange	IFRF Academy	European Flame Research Initiative
Find Expertise Advice Bureau Members Lists Browse IFRF groups		

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IFRF Website – Open Domain

- **The Monday Night Mail**

- IFRF's weekly electronic newsletter, published online and also emailed directly to IFRF Members. Non-Members are welcome to subscribe.

- **Industrial Combustion Journal**

- A refereed electronic journal for the publication of papers describing research and development in fields relating to industrial combustion.

- **Events Calendar**

- **Search Document archive facility**

- The IFRF database of some 5000 technical and other reports which represent 50 years of IFRF research. The reports archive includes all reports produced before January 2007.

IFRF Website – Members' Only Domain

- **Conference Proceedings**

- Papers and presentations from international IFRF conferences, Flame Days, TOTeMs and special workshops.

- **Members' Research Projects**

- Current reports generated within the context of the Members' Research Programme.

- **IFRF Online Combustion Handbook**

- Searchable database of concise Combustion Files compiled by an international group of authors and providing easy access to combustion design rules for practising combustion engineers and users of combustion equipment.

- **IFRF Members' Expertise Exchange**

- Some 130 Combustion Organisations and 1100 combustion experts worldwide

IFRF – The Online Combustion Handbook

The screenshot shows the homepage of the IFRF Online Combustion Handbook. The header features the IFRF logo and the title 'The Online Combustion Handbook'. Below the header, there is a welcome message and the ISSN number 1607-9116. The main content area contains two paragraphs of text describing the handbook's purpose and the types of information it provides. A navigation sidebar on the left includes links to the front page, glossary, and various filing systems. At the bottom of the page, there are buttons for 'Browse the Combustion Filing System' and 'Browse the Combustion File Data Base', along with a search bar and a link to 'the Industrial Combustion Glossary'.

IFRF
Combustion Handbook

Front page
Glossary
New Combustion Files
Filing System
Search Combustion Files
Converter

Log into backroom

Help ▾
Members Sites ▾
IFRF Links ▾
Open Services ▾
The Network ▾

Online Combustion Centre

Combustion Journal

The Online Combustion Handbook

Welcome to the
IFRF Online Combustion Handbook.


ISSN 1607-9116


The IFRF Online Combustion Handbook is a searchable knowledge resource. It gathers and presents practical combustion and environmental knowledge and information, and makes it available to the combustion community, to students, scientists and engineers.


This information is contained in searchable databases, initially in a Glossary, and in more detail as "Combustion Files", which are short, concise and reasonably self-contained information files, designed to answer the three generic questions: "What is?", "How do I?" and "What data is available for.....?"

Some information is in the open domain and can be accessed by the complete international combustion community. However, much of the combustion engineering information and the most up-to-date combustion files, are available only to Individual Members of the IFRF.

We invite you to explore the resource and to give us your reactions.

 the Industrial Combustion Glossary

 Browse the Combustion Filing System

Browse the Combustion File Data Base 

- Tarkoitettu nuorille ammattilaisille ja opiskelijoille
- Polton tietoutta
- Päivitys käynnissä
 - mm. laskenta- taulukoita

Poimintoja tapahtumakalenterista

- Kursseja
 - Energy from Biomass Consumption, Leeds University, 11.-15.1.2010
 - Ultra Low NOx Gas Turbine Combustion, Leeds University, 18.-22.1.
- TOTeM 34 – Gas Turbine Research: fuels/combustion and environmental protection, Gardiff University, 22.-23.4.2010
- Konferenssi: 35th International Technical Conference on Clean Coal and Fuel Systems, 6.-10.6.2010, Clearwater, Florida
- IFRF Joint Committee Meeting, 17.-18.6.2010, Renfew, Skotlanti
- Konferenssi: Impacts of Fuel Quality on Power Production and Environment, 29.8.-3.9.2010, Saariselkä, Suomi

IFRF – toimintaa jäsenille

- Meetings, Conferences
 - 16th Members' Conference in Boston in 2009
 - 17th Members' Conference in France in 2012
- IFRF.net website
 - Reports archive, 'Industrial Combustion', Combustion Handbook, Monday Night Mail, Solid Fuel Data Base
- Test Facilities, Probe and Instrumentation
- Consultancy



IFRF Suomen kansallinen osasto

- Finnish Flame Research Committee, FFRC
 - Yleishyödyllinen yhdistys, tavoitteena edistää poltto- ja palamistekniikan tietämystä ja tutkimusta Suomessa
 - Perustettu 1980
 - Hallituksen jäsenet (v. 2009)
 - Pasi Miikkulainen, Andritz Oy (puheenjohtaja)
 - Ari Saario, Oilon International Oy (varapuheenjohtaja)
 - Sture Boström, ProcessFlow Oy
 - Edgardo Coda-Zabetta, Foster Wheeler Oy
 - Matti Kytö, Metso Power Oy
 - Esa Vakkilainen, Lappeenrannan teknillinen yliopisto
 - Sihteeri
 - Ville Hankalin, Tampereen Teknillinen Yliopisto

FFRC – jäsenet v. 2010

- **Andritz Oy** (Pasi Miikkulainen)
- **Gasum Oy** (Sari Siitonen)
- **Fortum Power and Heat Oy**
(Marja Englund)
- **Foster Wheeler Oy**
(Edgardo Coda-Zabetta)
- **Metso Power Oy** (Matti Ylitalo)
- **Oilon International Oy**
(Ari Saario)
- **Outotec Oy** (Kaj Eklund)
- **VTT** (Jouni Hämäläinen)
- **Numerola Oy** (Pasi Tarvainen)
- **Process Flow Oy** (Sture Boström)
- **Kuopion Yliopisto**
(Jorma Jokiniemi)
- **Lappeenrannan Teknillinen Yliopisto** (Esa Vakkilainen)
- **Tampereen Teknillinen Yliopisto** (Antti Oksanen)
- **Teknillinen Korkeakoulu**
(Mika Järvinen)
- **Åbo Akademi** (Anders Brink)

FFRC – toimintaa

- Suomen osaston kokoukset
 - 3-4 kertaa vuodessa
 - Toiminnan suunnittelu, kv-raportointi, jne.
 - Seuraava kokous maaliskuun 16. päivä Gasumilla Kouvolassa
- Liekkipäivät
 - Kerran vuodessa, alkuvuonna
- Finnish-Swedish Flame Days
 - Joka 3. vuosi
 - tammikuussa 2009 Naantalissa, v. 2012 Tukholman seudulla
- Poltto ja Palaminen –kirja

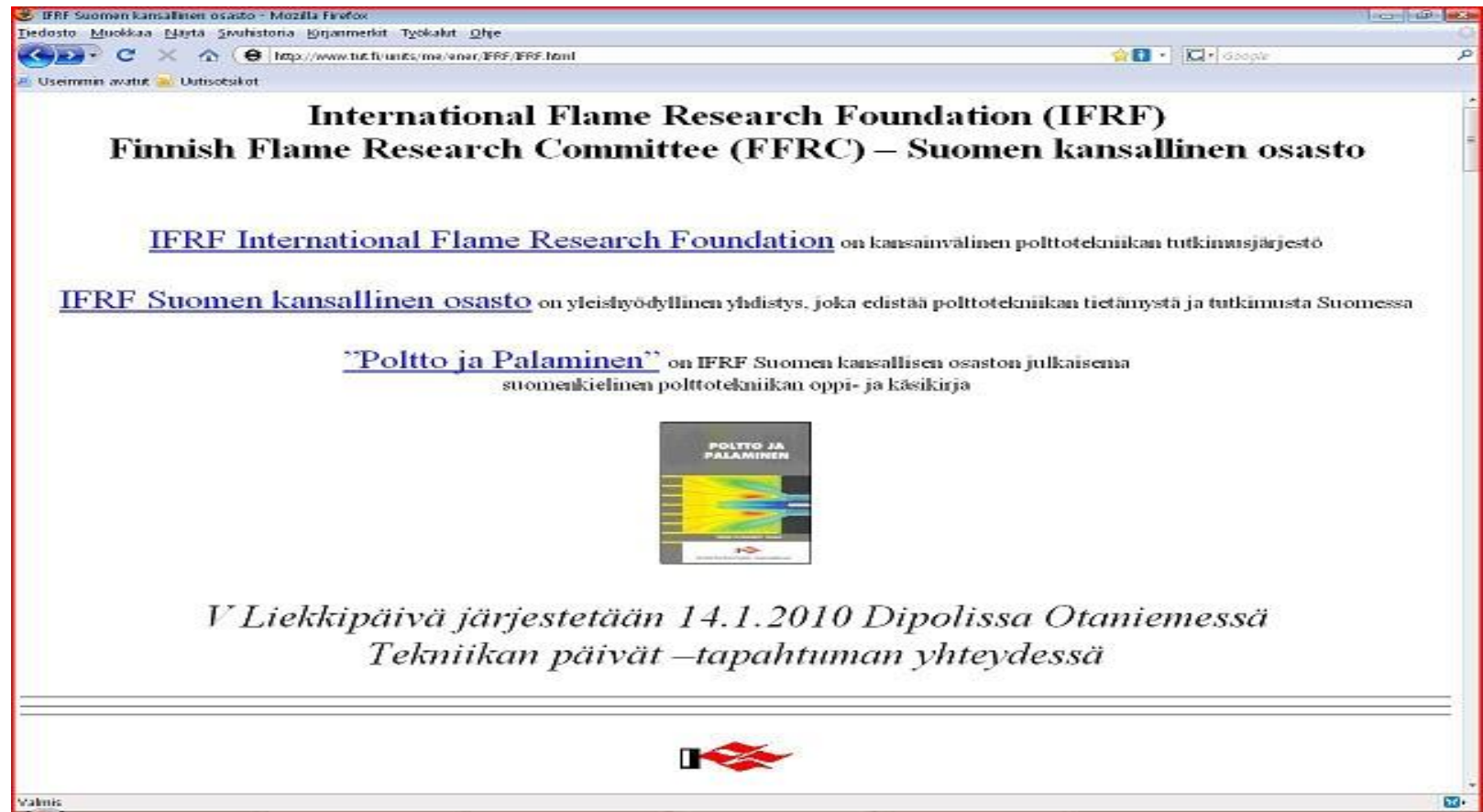


FFRC – Liekkipäivät

- **I Liekkipäivä 23.11.2004, Tampere**
- Swedish-Finnish Flame Days 2005, Borås
- **II Liekkipäivä 24.1.2006, Turku**
- **III Liekkipäivä 31.1.2007, Otaniemi**
- **IV Liekkipäivä 23.1.2008, Tampere**
- Finnish-Swedish Flame Days 2009, Naantali
- **V Liekkipäivä 14.1.2010, Otaniemi**

FFRC – verkkosivut

- www.tut.fi/units/me/ener/IFRF/IFRF.html




The screenshot shows a web browser window with the following content:

International Flame Research Foundation (IFRF)
Finnish Flame Research Committee (FFRC) – Suomen kansallinen osasto


[IFRF International Flame Research Foundation](#) on kansainvälinen polttotekniikan tutkimusjärjestö

[IFRF Suomen kansallinen osasto](#) on yleislyödyllinen yhdistys, joka edistää polttotekniikan tietämystä ja tutkimusta Suomessa

["Poltto ja Palaminen"](#) on IFRF Suomen kansallisen osaston julkaisema suomenkielinen polttotekniikan oppi- ja käsikirja



*V Liekkipäivä järjestetään 14.1.2010 Dipolissa Otaniemessä
Tekniikan päivät –tapahtuman yhteydessä*



Valmis

FFRC – tiedotus ja jäsenyys

- Tiedotus sähköpostitse (ja verkkosivuilla)
- Jokainen jäsenorganisaatioon kuuluva henkilö on FFRC:n ja IFRF:n jäsen
- Liittyminen FFRC:n sähköpostilistalle ja käyttäjätunnukset ifrf.net-sivustolle
 - ville.hankalin@tut.fi

FFRC – yhteystiedot

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Ville Hankalin

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