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FGF

Forschungsgemeinschaft Funk e.V.



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15th anniversary of FGF

Netzwerk für Forschung und Information

Preface

In 2007, the Forschungsgemeinschaft Funk e.V. has celebrated its 15th anniversary. A proud age for an association which was originally founded thinking that it would exist for about 3 years. The Board of Directors of the FGF was able to welcome more than 100 participants from near and afar at its celebration at the location of the Bonn University Club.

Famous lecturers could be won for the accompanying scientific symposium who, very competently, presented the state of the art of science in their survey lectures. Dipl.-Ing. Gernot Schmid had the honour to give a very impressive and understandable presentation of the contribution made by engineering science to the research into the compatibility of electromagnetic fields. Dr. Joachim Schüz spoke about the relevance of epidemiological studies and what expectations can be realistically met by this research field for the assessment of effects of EMF on humans and the environment. Not less impressive was the presentation of Prof. Alexander Lerchl focussing on the insights of experimental EMF research. An assessment of the health relevance of all research results and insights was provided by Dr. Paolo Vecchia, Chairman of the International Commission on Non-Ionising Radiation Protection (ICNIRP). The symposium was completed by Dr. Peter Wiedemann who showed the limitations of knowledge-based argumentations in public debates, but nonetheless restored the hope that the repeated reference to scientific knowledge in the long run will lead to the acceptance of scientific insights. (A more thorough report as well as the power-point presentations are available on the internet resp. can be found in the FGF NEWSletters 3/07 and 4/07).

During the celebratory part of the event, the FGF received the congratulations of the Federal Ministry of Economics, represented by the Director General Dipl.-Ing. Gerold Reichle who gave the FGF very good marks for its activities. The Chairman of the Board of Directors Dipl.-Ing. Karl-Wilhelm Siebert was very delighted to receive the praise in the name of all members and friends of the FGF. He interpreted the lauding words as an encouragement and an obligation for the future work of the FGF. In a lecture

on the future strategy and positioning of the FGF, he clearly emphasized that the FGF, despite other research projects, still plays a relevant role. FGF is known to guarantee the continuity of high-quality EMF research and the sustainability in the use of research findings.

One could close: „all's well that ends well“, and relax. But, unfortunately, the future of the FGF is not so rosy. As described repeatedly, the FGF is suffering from a loss of members and resulting smaller resources, which will result in a rethinking and a certain revision of its services.

What alternatives of change remain to the FGF without risking a substantial loss of quality?

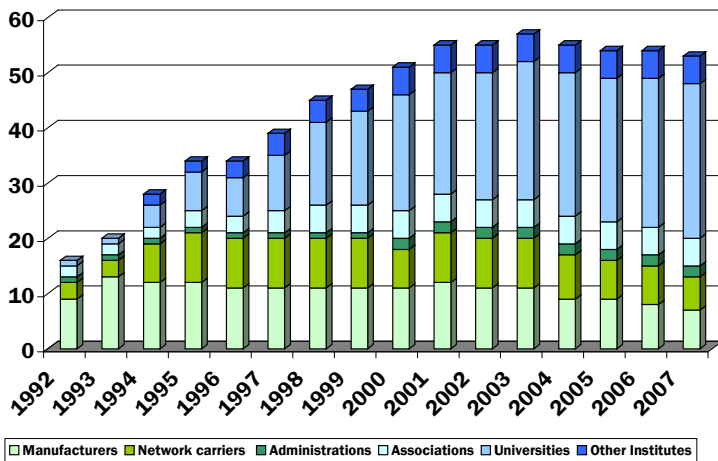
The development to be taken forward was introduced by Mr. Siebert in his celebratory lecture, where he clearly stated that the repositioning of the FGF has already begun. In the last years the Forschungsgemeinschaft Funk was no longer involved only in project commissioning, but has become an important platform for the dialog between scientists and stakeholders through its workshops. The workshops on the „blood-brain barrier“, on „genotoxicity“ or „sleep disorders“ addressed important questions and have positioned the FGF as a partner in the cooperation with the European COST initiative and the World Health Organization. This is also an important contribution to the networking of the German and international EMF research.

The annual report 2007 shall complement the survey given in the Festschrift on occasion of the 15 years anniversary regarding the contribution of the FGF to the research into biological effects of EMF by the current data from the year 2007.

Membership development

In 2007 the membership development registered the leaving of Swisscom AG from network operators and from industry the joining of Huawei Technologies Düsseldorf GmbH but also the leaving of Lucent Technologies Network Systems GmbH and Robert Bosch GmbH. Additionally the FGF registered the joining of Jacobs University Bremen as new member. The number of member organisations of FGF is now 53.

Membership development 1992-2007



Members

Network operators

- Deutsche Telekom AG
- T-Mobile Deutschland
- E-Plus Mobilfunk GmbH & CoKG
- Vodafone D2
- O2 (Germany) GmbH & CoKG
- France Telecom - FT Orange

Public broadcasting services

- ARD/ ZDF

Industry

- Daimler Chrysler AG
- Ericsson Telefonaktiebolaget LM
- Huawei Technologies GmbH
- Motorola GmbH
- Nokia Mobile Phones GmbH
- Siemens AG
- Kathrein-Werke KG

Authorities

- Federal Ministry of Economics and Technology
- Federal Office of Communications, Switzerland

Others

- German Working Committee for CB Emergency and Personal Radio
- German Amateur-Radio-Club e.V.
- Swiss Technical University Zurich
- University of Applied Science Berlin
- University of Applied Science Deggendorf
- University of Applied Science Dortmund
- University of Applied Science Kiel
- University of Applied Science Köln
- University of Applied Science Leipzig
- Distance Teaching University Hagen
- Forum Mobilcommunication Vienna
- Research Institute for telecommunications Dortmund
- GMT Bergische-Universität-GH-Wuppertal
- Society for the Scientific Examination of Parasciences
- Humboldt-University Berlin
- University of Economy and Technology, Saarbrücken
- Institute for Occupational Research and Continuing Education
- Institute for Mobile- and Satellite Communication Techniques
- Institute of Hygiene and Epidemiology, Warschau/ Polen
- Jacobs University Bremen gGmbH
- Austrian Research Center Seibersdorf
- PIOM Bordeaux
- Police Academy Münster
- Aachen University of Technology, Res. Center for Bioelectromagnetic Interaction (FEMU)
- Technische Universität Braunschweig, Forschungsverbund: EMV biologischer Systeme
- Technical University Graz
- Technical University Hannover
- Technical University Ilmenau
- Technical University Karlsruhe
- Technical University München
- Universidad Politecnica de Madrid
- University of Dortmund
- University of Mainz, Clinics for Psychiatry and Psychotherapie
- University of Montpellier, Section de Nimes, Laboratoire de Biophysique Médicale
- University of Stuttgart
- University of Rostock
- University of Witten-Herdecke

Research Activities of FGF

State of own projects (at the end of 2007)

In 2007 the FGF dealt with 5 ongoing projects and observed the activities after the closure of 7 projects. Basically the project management in the research working group (AG F) goes from the first planning to the peer-reviewed publication of results.

Ongoing projects and projects completed in 2007

Knowledge-based literature database. (Prof. Jiri Silny, „femu“ at the Clinics of the RWTH Aachen)

(„EMF portal“, www.emf-portal.de)

The established EMF literature database is annually co-funded by the FGF. Data contents by November 2007 (+ increase since Nov 2006): about 11,230 publications (+ 830), 1573 extracted basis data sets (+ 216), about 3800 extracted exposure data sets (+ 433), 2360 glossary entries (+ 170).



Please see the „femu research report 2007“, p. 41 to 76, for details. (http://femu.rwthachen.de/pdf/femu_forschungsbericht_2007.pdf). The steering group of the funding organisations met two times, on March 15th, 2007 and October 19th, 2007 in Aachen.

Experimental study on potential interactions of 3rd generation mobile communication systems (UMTS) with biological systems for investigating the health risk for humans.

Experiments with rats for the first study part (90-days study), the second part (2-generations study) and the third and last part (neurotoxicity study) have been finished. A written report on the first part was accepted in 2006, a report on the second part is presently in the review process for acceptance. The third part is in the phase of evaluation. Duration of the experimental part: 4/2002 to 6/2007



Numerical body dosimetry in complex field distributions. (Prof. Nils Kuster, IT'IS Foundation, Zurich)

The practical part was finished in August 2007. Final presentation in August 2007. Manuscript for publication was submitted to the FGF in December 2007 as a final report. Duration of the experimental part: 11/2006 to 8/2007

Replication study on the effects of chronic GSM-like field exposure on the survival rate of female Sprague-Dawley rats.

The project is ongoing since July 2005. Funding by the FGF since January 2007. Duration of the experimental part: 7/2005 to 5/2008 (estimated).

Good Science Approach – Lessons learnt.

New long-term project on the improvement of quality of EMF research, also in view of the improvement of the criteria for future calls for tender of the FGF. Among other things, the scientific literature in different fields of research shall be investigated for methodological possibilities and limitations. It was decided in 2007 to commission firstly an expert to make a pilot study on the topic „Heat-shock proteins“ (HSP). A requirement profile for the pilot study

was prepared. Until the end of 2007, there was still no definite agreement of any of the experts who were asked to carry out the pilot study.
Planned duration of the first pilot study: 3-6 months.

Two other planned projects already approved by the FGF Board of Directors in 2006 were cancelled on January 31, 2007 by board decision after preceding long discussions in the AG F. For one project an overlap with a project of the German Mobile Telecommunication Research Programme was stated; for the other one, a project from the area of social sciences, one saw no sufficient competence in the AG F.

Postmanagement of projects finished before 2007

Follow-up study on FGF project no. 33:

Short-term and longterm effects of radiofrequency EMF on the quality of human sleep and the resulting well-being during the day.

(Prof. Aldenhoff, Dr. Fritzer, University of Kiel; Prof. Hansen, University of Wuppertal)

Results of the entire project published peer-reviewed (Fritzer et al.) in May 2007 in *Bioelectromagnetics* (online published in January 2007).

EM field sensor in cell membranes (experimental investigations on artificial lipid membranes „bilayers“).

(Prof. Boehm, University of Bochum; Prof. Hansen, University of Wuppertal)

Manuscript for peer-reviewed publication (Wrobel et al.) in *Bioelectrochemistry* was rejected in September 2007, after having been accepted before, and after a longer discussion between editor and authors of the publication regarding a revision of the manuscript. Attempts by the main author to clarify the situation as well as to resubmit the manuscript to another journal are ongoing.

Provocation study on physiological parameters of the visual system under the influence of radiofrequency EMF in humans.

(Prof. Zeitlhofer, University Clinics for Neurology,

Vienna; Dipl.-Ing. Schmid, ARC Seibersdorf research GmbH, Seibersdorf)

The plan to publish further results in a second publication (with the focus on biomedical results,



Sauter et al.) was quit by the authors. However, a follow-up project not funded by the FGF, but with use of the exposure system of the FGF (upon mutual agreement), was published in October 2007 in *Bioelectromagnetics* (Unterlechner et al.) - at first only published online.

Provocation study on electrosensitivity of single human individuals.

(Dr. Kunz, Fraunhofer Institute for Information and Data Processing, IITB, Karlsruhe)

The manuscript submitted for publication (Kunz) to the journal *Environmental Health Perspectives (EHP)* was rejected in October 2007. After contacting the editor of the journal *Bioelectromagnetics* and obtaining a positive response the manuscript will now be adapted to the formal requirements of the journal and shall then be submitted again.

Investigation of possible effects of electromagnetic fields emitted by mobile phones on human cognitive and brain function.

(Dr. Haarala, University of Turku; Prof. Krause, University of Helsinki)

Publication of further results in a second, third, and fourth peer-reviewed publication (Pesonen et al., Haarala et al., Krause et al.) in March 2007 in *Brain*

Research resp. May 2007 in *Bioelectromagnetics* (all online published in January 2007).

Effects of weak radiofrequency EMF (383 MHz, 900 MHz and 1.8 GHz) on the melatonin synthesis and reproductive functions of male Djungarian hamsters.

Concept, construction and computer simulation of exposure systems for the investigation of the melatonin synthesis of male Djungarian hamsters.

(Prof. Lerchl, Jacobs University Bremen, study performed at the University of Münster; Prof. Hansen, University of Wuppertal)

Peer-reviewed publication of first partly results (Lerchl et al.) - at first only online published - in October 2007 in the *Journal of Pineal Research*.

Project supported by coordinating measures:

Influence of radiofrequency fields on the expression of endothelial tight junction genes and proteins in the blood-brain barrier.

(Prof. Krause-Finkeldey, University of Bochum)

In this project, the support of the FGF was limited to observing the progress as well as taking coordinating measures for project planning and performance. As a result, the FGF obtained two copies of the resulting dissertation entitled:

„Ladage, K.: *Biomolecular investigations on the influence of inflammatory mediators and electromagnetic fields on tight junction components of the blood-brain barrier. Faculty of Biology, Ruhr-University Bochum.*“ (in German)

The peer-reviewed publication of the results is planned.

Publications from FGF projects 2007

The FGF prompts its project leaders to publish their study results - as far as possible - in peer-reviewed scientific journals.

Fritzer, G., Göder, R., Friege, L., Wachter, J., Hansen, V., Hinze-Selch, D., Aldenhoff, J.B.: Effects of short- and long-term pulsed radiofrequency

electromagnetic fields on night sleep and cognitive functions in healthy subjects. *Bioelectromagnetics* 28 (4): 316-325 (2007)

Haarala, C., Takio, F., Rintee, T., Laine, M., Koivisto, M., Revonsuo, A., Hämäläinen, H.: Pulsed and continuous wave mobile phone exposure over left versus right hemisphere: effects on human cognitive function. *Bioelectromagnetics* 28 (4): 289-295 (2007)

Lerchl, A., Krüger, H., Niehaus, M., Streckert J.R., Bitz, A.K., Hansen, V.: Effects of mobile phone electromagnetic fields at nonthermal SAR values on melatonin and body weight of Djungarian hamsters (*Phodopus sungorus*). *J. Pineal Res.* (published online: Oct. 25, 2007)

Pesonen, M., Hämäläinen, H., Krause, C.M.: Brain oscillatory 4-30 Hz responses during a visual n-back memory task with varying memory load. *Brain Res.* 1138: 171-177 (2007)

Krause, C.M., Pesonen, M., Haarala Björnberg, C., Hämäläinen, H.: Effects of pulsed and continuous wave 902 MHz mobile phone exposure on brain oscillatory activity during cognitive processing. *Bioelectromagnetics* 28 (4): 296-308 (2007)

Kunz, S.: Provocation study about electro sensitivity to the electromagnetic field resulting from D-net base stations at 900 MHz. *Environmental Health Perspectives (EHP; rejected)*, *Bioelectromagnetics* (in preparation)

Unterlechner, M., Sauter, C., Schmid, G., Zeitlhofer, J.: No effect of an UMTS mobile phone-like electromagnetic field of 1.97 GHz on human attention and reaction time. *Bioelectromagnetics* (published online: Oct. 23, 2007)

Wrobel, G., Wienand, A., Boheim, G.: Radio frequency energy absorption by planar lipid bilayers and membranes doped with ion-channel oligopeptides. *Bioelectrochemistry* (rejected), (in preparation)

Other research activities

Internal project „pulsed fields“

The aim of this internal working group project is to confirm or disprove by scientific facts the popular opinion that „pulsed“ fields could couple - more than „non-pulsed“ fields - into life processes and therefore develop stronger (and possibly dangerous) effects. As a result of this work, a book was prepared, summing up in a generally understandable manner what doubtless facts are actually available and where we are dealing with not and/or not fully verified opinions or mistaken ideas.

The manuscript was completed in 2007 and submitted to the collaborating „Professional Association for Electrical Engineering, Textile and Precision Mechanics“ (BGETF) for printing.

Project listings

All lists on the FGF internet and intranet pages on FGF projects as well as on national and international EMF projects have been regularly maintained and updated. Only until mid-year 2007, part of this work was also the co-maintenance of the EMF project database of the WHO in Geneva.

Colloquia/seminars of the FGF

A final colloquium on the project „Numerical body dosimetry in complex field distributions“ took place on August 23, 2007 in Düsseldorf.

The celebration of the 15th anniversary of the FGF included a scientific symposium on September 12, 2007 at the „University Club“ in Bonn. There was detailed information about this event in the FGF NEWSletters 3/2007 and 4/2007.

Participation of the FGF in external scientific events

The FGF participated in the 8th Congress of the European Bioelectromagnetic Association (EBEA, 10-13 April 2007 in Bordeaux) and the 29th Annual Meeting of the Bioelectromagnetics Society (BEMS, 10-15 June in Kanazawa, Japan) with two representatives each. Own contributions were presented each time. Reports on the events are to be found in FGF NEWSletter 2/2007.

At the 9th Expert Meeting of the „German Contact Lens Association of Ophthalmologists“ (DAKG) on 24 and 25 November in Hamburg an invited representative of the FGF held a lecture on the topic „Effects of electromagnetic radiation on the visual organ“ (audience of about 150 ophthalmologists).

For the first time a representative of the FGF attended the „Science Brunch“ of the Swiss „Research Foundation Mobile Communication“. The seventh event in this series took place on November 30, 2007 in Zurich to deal with „Electrosensitivity“.

Cooperations with organizations and institutions

2007 was again marked by intense cooperation with national and international organisations and institutions. Among them were the WHO, Femu, EMF-Net, the Bioelectromagnetics Society (BEMS), universities and science institutes, the Mobile Manufacturers Forum (MMF), the Informationszentrum Mobilfunk (IZMF), Forum Mobilkommunikation (FMK) Austria, FormMobil Switzerland etc.



The formal termination of the European research association „Cooperation in Science and Technology“ (COST281) by its secretariat (managed by the FGF) as well as the involvement in the preparation of a new follow-up research cooperation again demanded much effort on the part of FGF regarding special knowledge, time and organizational aspects.

Workshops and information events of the FGF

Workshop: „**Genotoxic Effects of Radiofrequency Fields – Lessons from the Conflicting Results**“, Neuherberg near Munich (hosted by the BfS), May 11, 2007

Background of the workshop were the controversial cytogenetic results of the REFLEX program at radio-frequency exposure and the attempts to replicate them.

Reports and commentaries as well as the presentations are found on the internet under 14th FGF workshop:

http://www.fgf.de/english/research_projects/workshops.html

Workshop: „**Sleep Disorders, EEG-Changes, Altered Cognitive Functions - Is There a Connection With the Exposure to Mobile Communication RF Fields?**“, Stuttgart, 5-7 November 2007

The topic of the brain and radiofrequency fields has recently been investigated by many research groups and remains a controversially discussed issue. Cooperation: Baden-Württemberg Ministry of the Environment, EMF-Net

Short versions and lectures as well as reports can be downloaded under 16th FGF workshop at: http://www.fgf.de/english/research_projects/workshops.html



Informational event: „**Mobile phones and co. - what about health?**“, Vienna, 12 November 2007, organized in cooperation with Forum Mobilkommunikation Austria (FMK)

This event with lectures and discussions reflected the current state of the art of research into health



effects of radiofrequency electromagnetic fields. It addressed representatives of authorities, physicians, scientists, journalists and interested laypersons.

Short versions, lectures, a press release and a report can be downloaded under 15th FGF workshop at:

[http://www.fgf.de/english/research_projects/workshops.html]

Press and public relations

The FGF seeks to promote the dialog between science and society and to understandably prepare the complex issue of electromagnetic compatibility with the environment (EMCE) also for non-scientists and interested laypersons by its public relations work. In the focus are the national and international research.

Foci of the activities in 2007 were:

- the publications *NEWSletter* and *INFOline*
- the concept and implementation of a new FGF webpage
- the response to specialist inquiries and the provision of objective information
- the participation in the „Wissenswertes“, the Bremen forum for scientific journalists
- press work on the activities of the FGF.

Newsletter

In 2007 four *NEWSletter* issues with a total of 33 articles (seven only online) were published. The edition 3/2007 was devoted as a Festschrift entirely to the 15 years anniversary of the FGF and has already been published in English (online). Of the Festschrift 4000 copies were distributed, the other issues with 3600 copies each. Printing costs for the *NEWSletter* could be further optimized.



All *NEWSletters* are found online at: <http://www.fgf.de/english/publications/newsletter.html>.

Infoline

The *INFOline* weekly reports current news regarding EMCE. It is sent to internal and external subscribers and can be downloaded from the internet. It provided information on the topic of EMCE with

729 articles in 51 issues. The number of external subscribers was 478 at the end of the reporting period.

In addition, per month about 9000 *INFOline* were downloaded from the webpage (4000 in English). Thus the *INFOline* is one of the communication tools of the FGF used most frequently.

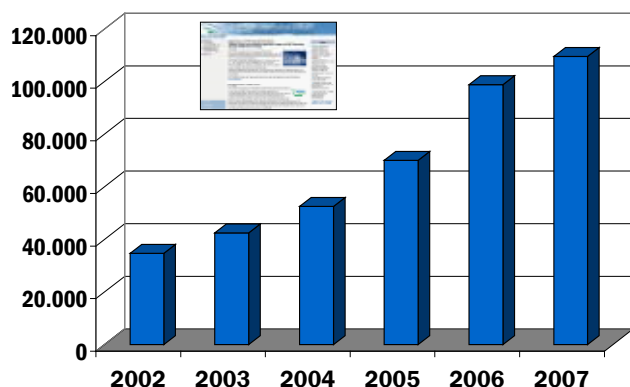


Internet

Besides the maintenance and updating of the current webpages, in 2007 the work on a new concept and the implementation of a new web presence began. It shall replace the old pages at the beginning of 2008 with a new design, an optimized structure, improved technology and extensive services.

The development of page views for the entire internet service of the FGF in 2007 follows the positive trend of the last years and is now at more or less 110,000 pages per month. This is an increase by 10% compared to the last year. The percentage of English pages and documents from the entire statistics is about 30%. Most often single *NEWSletter* articles and the weekly *INFOline* are viewed.

Average page views per month



Press work

In its press work, the FGF provides information about own activities and research results. The press releases are distributed by Informationsdienst Wissenschaft (IDW), one of the most important platforms for scientific news in the German-speaking world, to an average of 13,000 subscribers. They are available online on the website of the IDW at <http://www.idw-online.de>. In the reporting period the following news were published:

- mobile communication and health: expert meeting investigated evidence of changes in sleep behavior and the brain activity of humans (12.6.2007)
- 15 years of mobile phones - 15 years of research engagement (9.4.2007)
- sleep quality and brain function not affected by mobile communication fields (25.1.2007)
- study does not provide evidence of effects on brain functions from mobile communication fields (1.11.2007).

The media resonance to these activities can be seen in different press publications and special requests regarding the respective topic leading to a partially close contact to the requesting journalists.

Response to special requests and provision of objective information

In 2007, the FGF office again obtained many special requests asking for short-term statements about current topics.

Topic-specific research was made and extensive material was collected. Thus, FGF members, media representatives and citizens thus could be provided with scientifically substantiated information for their work.

As an example of the about 50 requests the cooperation with the authors of the broadcast „Quarks

& Co“ of the broadcasting cooperation Westdeutscher Rundfunk shall be mentioned here, which on June 19, 2007 was devoted to the topic of mobile communication and health under the title: „Ill from mobile phone radiation?“

FGF on the „Wissenswertes“, the Bremen forum for scientific journalists

On November 26 and 27, the FGF participated with an information booth in the accompanying special conference, the „WissensCampus“.



Source: Messe Bremen

In many conversations, interviews and a spot for NDR television information about the topic mobile communication and health as well as the work and achievements of the FGF could be presented.



Prospects for the year 2008

The „re-invent“ of the FGF must be continued also in 2008. In view of the financial resources of the FGF, the coming year will be marked by identifying possibilities of optimization and potential for cutting costs.

With the start of the new COST action „BM 0704“, which will also be supported by the FGF, there will be new perspectives for the FGF regarding its integration in the European EMF research and thus the scientific research and communication network.

The work foci of the FGF shall in future be based on four aspects:

1. Information

The provision of transparent information about EMF research for the FGF members and the interested public: examples are the internet and intranet portal of the FGF, its publications or also the support of the EMF portal of the RWTH Aachen referenced by the WHO.

2. Dialog

A platform for the dialog of the important stakeholders: project presentations and workshops of the FGF promote making contacts and having conversations to obtain information about biological issues and emerging technologies early on as well as discuss different research approaches constructively.

3. Aggregating knowledge

Workshops for the opinion formation in science: Based on the past experiences, important scientific specialist questions shall be addressed. This shall contribute to the clarification of scientific issues both in research and the discussion about risks of EMF in society.

4. Gaining competence

Original research promotion: The promotion of experimental research projects will continue to be a core task. Only that institution which actively accompanies research projects maintains the competence to correctly assess current research.

With this positioning, the FGF will be able to make an important contribution to an objective and responsible dealing with radio technologies for its members as well as interested stakeholders.

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