

Personal Experience with the ERC Starting Grant

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Where to get information

Google: ERC Starting Grant

or

Cordis.europa.eu

or

get a hint from your boss

(i.e. give the hint to your Postdocs!)

My previous applications

- **APART (Austrian Prog. for Research and Technology)**
Austrian Academy of Sciences
(funded)
- **MPG Junior Research Group**
(funded)
- **Sofja Kovalvskaja Award**
Alexander von Humboldt Foundation
(funded)
- **EURYI Award**
(declined due to funding above)

European Research Council

Reason for application

- 1) amount of funding (up to **2 M€**) and duration (**5 years**)

2.4. What is the typical size of an ERC grant?

ERC Starting Grants last up to five years and provide **€100,000 to €400,000** of funding per year, amounting to a total of €0.5 to 2.0 million per grant.¹²



- 2) **100% coverage** of direct costs

Box 4: Eligible and non-eligible direct and indirect costs

An ERC grant can cover up to 100% of the total eligible direct costs of the research plus a contribution towards indirect costs, which cannot exceed 20% of the total eligible direct costs (excluding the direct eligible costs for subcontracting and the costs of reimbursement of resources made available by third parties which are not used on the premises of the beneficiary).

Preparation of the application

Phase 1: 8 pages

Phase 2: 16 pages

Oral presentation in Brussels

Preparation of the application

Phase 1:

- precondition: 2 – 9 years Postdoc
- 8 pages

→ 9300 applicants!!!

559 applicants (6%) selected in 1st round

most important to transport message!

Preparation of the application

Phase 1:

- 300 reviewers
- each application reviewed by 4 persons

→ 37,000 reviews

120 on average per reviewer

emphasize important things “bold” and “italic”

Phase 1



European Research Council

ERC Grant Schemes

Guide for Applicants

30 March 2007

The Guide is published by the ERC Scientific Council on <http://erc.europa.eu>.
It can also be downloaded from the CORDIS page on <http://cordis.europa.eu>

1 afternoon

European Commission
FP7 Specific Programme IDEAS





Preparation of the application

European Research Council

ERC Grant Schemes

Guide for Peer Reviewers

Applicable to the ERC Starting Grants

2 August 2007

1. Principal Investigator: Potential to become an independent research leader <i>Quality of research output:</i> Has the Principal Investigator published in high quality peer reviewed journals or the equivalent? To what extent are these publications ground-breaking and demonstrative of independent creative thinking and capacity to go significantly beyond the state of the art? <i>Intellectual capacity and creativity:</i> To what extent does the Principal Investigator's record of research, collaborations, project conception, supervision of students and publications demonstrate that he/she is able to confront major research challenges in the field, and to initiate new productive lines of thinking?	4 / 5
2. Quality of the proposed research project <i>Ground-breaking nature of the research:</i> Does the proposed research address important challenges in the field(s) addressed? Does it have suitably ambitious objectives, which go substantially beyond the current state of the art (e.g. including trans-disciplinary developments and novel or unconventional approaches)? <i>Potential impact:</i> Does the research open new and important scientific, technological or scholarly horizons? <i>Methodology:</i> Is the outlined scientific approach (including the activities to be undertaken by the individual team members) feasible?	3.8 / 5
Total mark	7.8 / 10
Has the proposal passed the threshold (8/10)?	No

Phase 1

Find a cool Acronym

Attosecond Dynamics On Interfaces and Solids
ADONIS

(2550) When one reads a research proposal as interesting and well written as ADONIS (apart from the unfortunate acronym of a mythological figure who died very young), one wonders why so many funds are wasted in particle and nuclear physics. The techniques employed are novel,

Phase 1

A. Principal Investigator (PI)

i. CV Reinhard Kienberger

Main scientific achievements:

- First generation and measurement of a single sub-femtosecond pulse [1, see list below]
- Motion control of electrons on an attosecond time scale [2]
- First time-resolved measurement of an atomic inner-shell decay [3]
- Development of a measurement system capable of measuring intervals as short
- as 100 attoseconds, which is shorter than the orbit time of a hydrogen electron (150 as) [4]
- First direct measurement (sampling) of the electric field of a light pulse [5]

The work was carried out under several national and international collaborations:

- MPQ, Germany, Hänsch group: light phase control
- MPQ, Germany, Walther group: electron spectroscopy
- University of Bielefeld, Germany, Heinzmann group: x-ray mirrors
- AMOLF Amsterdam, Netherlands, Vrakking group: spectroscopy
- Vienna University of Technology, Austria, Scrinzi group: theory
- NRC, Canada, Corkum group: theory
- UEC Tokyo, Kobayashi group: HHG with IR light

Phase 1

ii. Self Evaluation

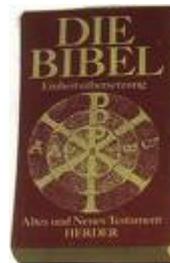
In 2002/2003 I supervised practical courses for undergraduate students at Vienna University of Technology. I have been **coordinating the work of 4 undergraduate and 8 Ph.D. students**; 2 undergraduate and 2 Ph.D students graduated already.

In 2004 I developed a new measurement system for femtosecond hard x-ray pulses at the Stanford Linear Accelerator Center SLAC, CA, USA. Starting with the idea I managed the **design, construction and set-up of this project comprising more than 300 k\$ of material costs and led the experiments with some 15 coworkers.**

Phase 1

iii Funding ID

- 1) Sofja Kovalevskaja Award, Alexander von Humboldt Foundation, PI, 1.05 MEUR for attosecond experiments in molecular systems in the gas phase, start: Nov 8-2006, 48 months
- 2) Cluster of Excellence 'Munich-Centre of Advanced Photonics (MAP)', Deutsche Forschungsgemeinschaft (DFG), PI in one project, 70 kEUR, start: Jan 1-2007, 36 months.



Mt 25,29 *“Denn wer da hat, dem wird gegeben werden,*

Phase 1

B. Research Project

Points I adhered to:

- Fully Referenced
- Included Figures
- Clear structure

by Valer Tosa and Vladislav Yakovlev at MPQ (Fig. 1).

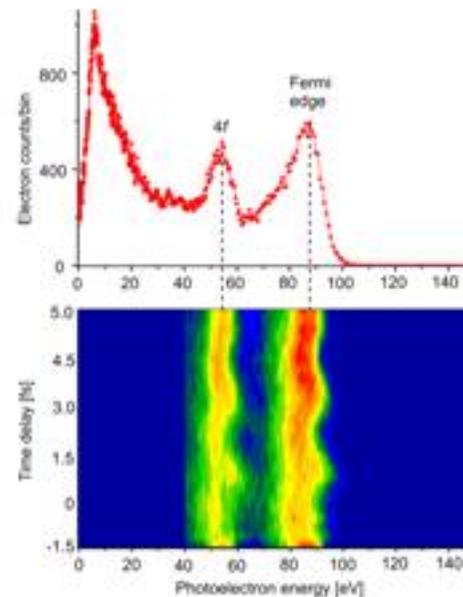


Fig 2. Photoemission spectrum and ATR streaking spectrogram of $4f$ (core level) electrons and valence electrons from a tungsten surface. The proof-of-principle measurement underlines the potential of the ATR method to gain information on timing, duration, and evolution of the photoemission process [4].

These few hundred eV attosecond pulses shall be used in the proven pump/probe scheme [1] to investigate ultrafast electron dynamics on solid surfaces in a so far not reached resolution. An attosecond pulse will trigger an electronic process in the solid or on the surface leading to direct or indirect (Auger process, auto-ionization) electron emission. These electrons will be streaked by the dressing laser field so that information on timing, duration, and evolution of the process can be gained (Fig. 2). Understanding of these processes may have a huge impact on various fields in science as pointed out above.

The experiments envisaged so far are:

- a) Temporal evolution of direct photoemission. In previous experiments, photoemission from tungsten (100) surfaces showed differential time shifts in the attosecond range between core and valence electron signals. These measurements will be repeated under much better experimental conditions and extended to tungsten surfaces different from

Phase 1

C. Research Environment

i. Transition to independence

The ERC Starting Grant would be a very **important step in my scientific career to gain further experience in leadership and undertake scientific work towards my future plan of an own scientific group.** The topic of this proposal is a completely new field in science which would give me a unique opportunity to clearly **distinguish myself from other attosecond activities at the MPQ.**

ii. Hosting institution

iii Budget

I would like to emphasize that the MPQ houses or develops a big amount of the required resources, such as the costly laser systems and XUV sources which are unique in the world, and that the **MPQ is willing to provide them for this research**

submission

- Get familiar with the EU websites and the submission system in an early stage. Pre-registration is important.
- **It is possible to submit the full application in an early stage and make corrections afterwards. Submit as soon as you have a draft!!!.**

3.2.3 Electronic Proposal Submission

Proposals should be submitted electronically via the web-based Electronic Proposal Submission Service (EPSS).¹⁶

Insertion of 2nd stage deadline: 17 September 2007 at 17.00
(Brussels local time)

One colleague started to upload at 4 p.m.

The upload was too slow. At 5 p.m. he was kicked out!!!

Phase 2

A) Principal Investigator

just blow up and „show off“

I have given **more than 30 invited talks at international conferences, including a keynote talk at CLEO Europe**, invited lectures at the University of Würzburg, Germany, ETH Zürich, Switzerland, UC Berkeley, USA and Stanford University, USA, and authored or co-authored more than 10 book chapters on attoscience as a first author..

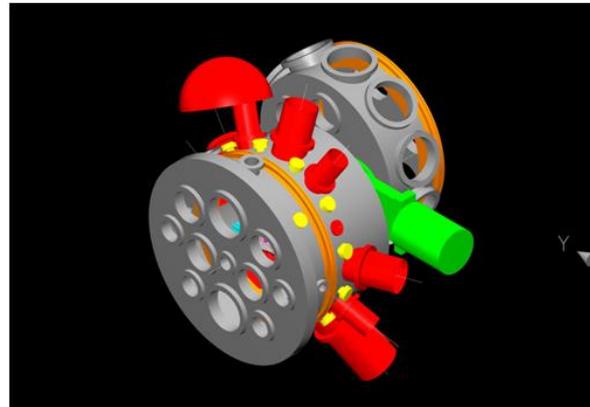
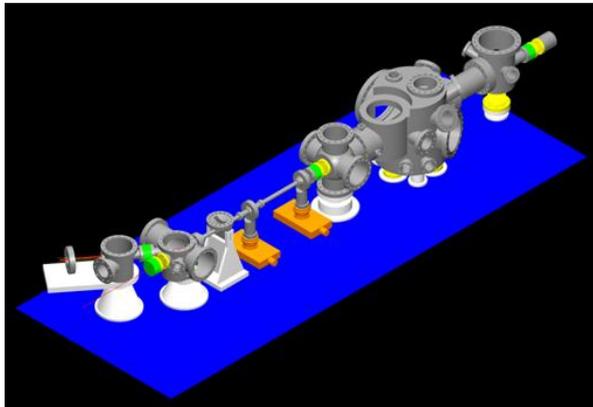
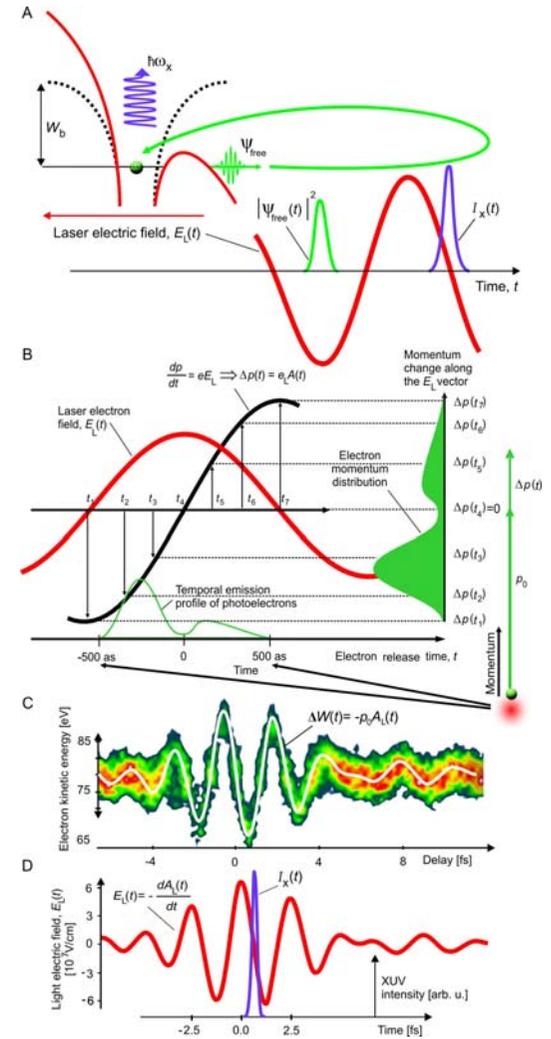
The papers listed above have been cited about 1500 times within the past few years. Our work on attosecond science was show-cased as one of the Top Ten Research Highlights of the Year by *Science* and *Nature* magazines in 2002 and the Physics Highlights of the Year by the American Physical Society in 2002 and 2003. Thomson ISI has identified one of my papers as one of the most frequently cited recent papers in the field of physics (<http://www.esi-topics.com/nhp/nhp-july2005.html>). The work was reported in more than 100 commentaries in newspapers and other media on five continents.

Phase 2

B) Research Project

more details

detailed plans



Phase 2

schedule and milestones

The following table shows the planned schedule of the project:

Position	Year 1			Year 2			Year 3			Year 4			Year 5		
setup development	M1			M2			M5								
a)				M4											
b)				M3			M6								
c)												M7			

Milestones: (* see also section C.iii)

- M1 (T0+9) Design and manufacturing of experimental and preparation chamber*
- M2 (T0+18) Design and manufacturing of manipulators and (electron) detectors*
- M3 (T0+21) Resonant radiation for Ni satellite
- M4 (T0+27) Absolute timing of photoemission process
- M5 (T0+30) Design and manufacturing of manipulators and ion detector*
- M6 (T0+45) Real-time measurement of resonant vs non-resonant emission in Ni
- M7 (T0+60) Dynamics of charge transport on surfaces

Phase 2

C) Research Environment

budget breakdown

Table 3.1 lists the costs needed for the project during the five year funding period.

Position	Year 1	Year 2	Year 3	Year 4	Year 5	sum pos.
Personnel costs (see text)	90	90	90	90	90	450
Equipment (see below)	165	165	90	0	0	420
Consumables	50	50	50	65	65	280
Travel costs	15	15	15	15	15	75
Publication costs	5	5	5	5	5	25
Overheads (20%)	65	65	50	35	35	250
Total	390	390	300	210	210	1500

Table 3.1: Costs in k€. Equipment costs are specified below.

The costs for the equipment planned to be purchased in the first three years are:

Year 1

a) Experimental chamber, UHV, rotatable part for angular res.	65 k€
b) Components beamline, UHV	30 k€
c) Manipulator, 4 deg. of freedom	25 k€
d) Pumps (turbo pump, pre-pumps)	30 k€
e) Vacuum components (valves, gauges)	15 k€
Total	165 k€

Year 2

a) Time of flight detector, electrons	35 k€
b) Preparation chamber UHV	30 k€

Phase 2: “Host Agreement”

- Host Agreement is part of Phase 2
- Extremely important: Offices, Labs, additional funding etc. must be clarified in advance

→ *at MPQ*:

Liebe Nachwuchsgruppen-Leiter,

im Zusammenhang mit aktuellen Anträgen auf Projektförderung von Nachwuchsgruppen aus unserem Hause möchte ich Sie darüber informieren, dass das Direktorium in seiner letzten Sitzung entschieden hat, Ressourcen der Nachwuchsgruppen von Seiten des Instituts (bei Verlängerung der Projektdauer über Drittmittel, etc.) prinzipiell auf **ein Labor plus fünf Büroarbeitsplätze** zu begrenzen. Die Ressourcen werden von Seiten des Instituts für eine maximale Dauer von insgesamt sieben Jahren zugesagt, **d. h. dass Anträge auf Projektförderung auf die Zusage der o. g. Ressourcen sowohl räumlich, als auch personell und zeitlich entsprechend anzupassen sind.**

Mit vielen Grüßen

Interesting: ERC is transferable

3.) Presentation

- exactly **10 minutes** (measured by the chair)
- ppt presentation (appr. 1 week preparation)
- additional **15 minutes** for questions

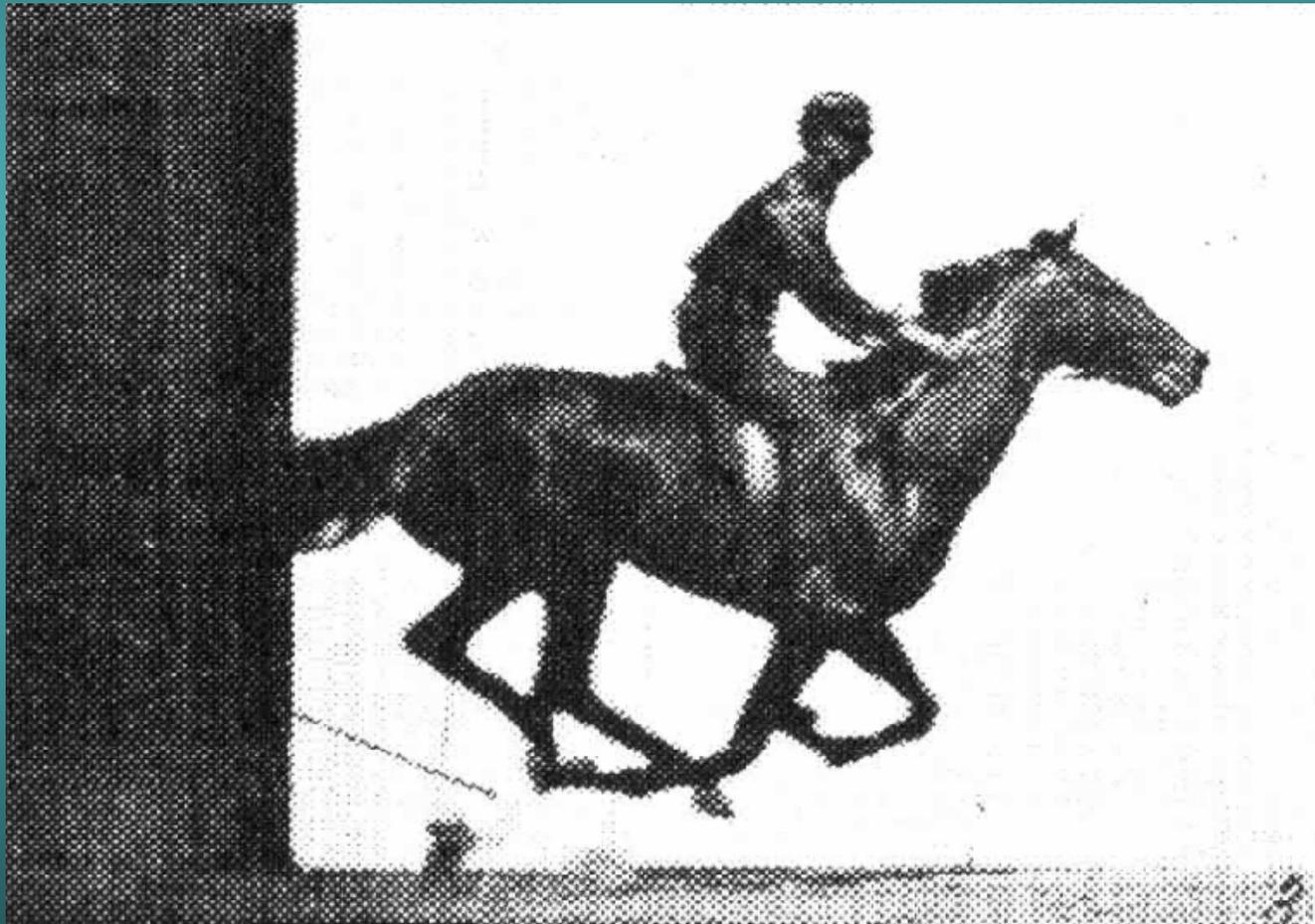
12 out of 24 in my panel.....

3.) Presentation

Show something understandable

1878: E. Muybridge, Stanford

Tracing motion of animals
by spark photography



E. Muybridge, *Animals in Motion*, ed. by L. S. Brown (Dover Publ. Co., New York 1957)

3.) Presentation

Show something impressive

nature

SEE HOW THEY RUN

Attosecond electron transport in real time

Cover story: October 25th

AFGHANISTAN
Natural resources
as a lifeline

CLIMATE POLITICS
A radical alternative

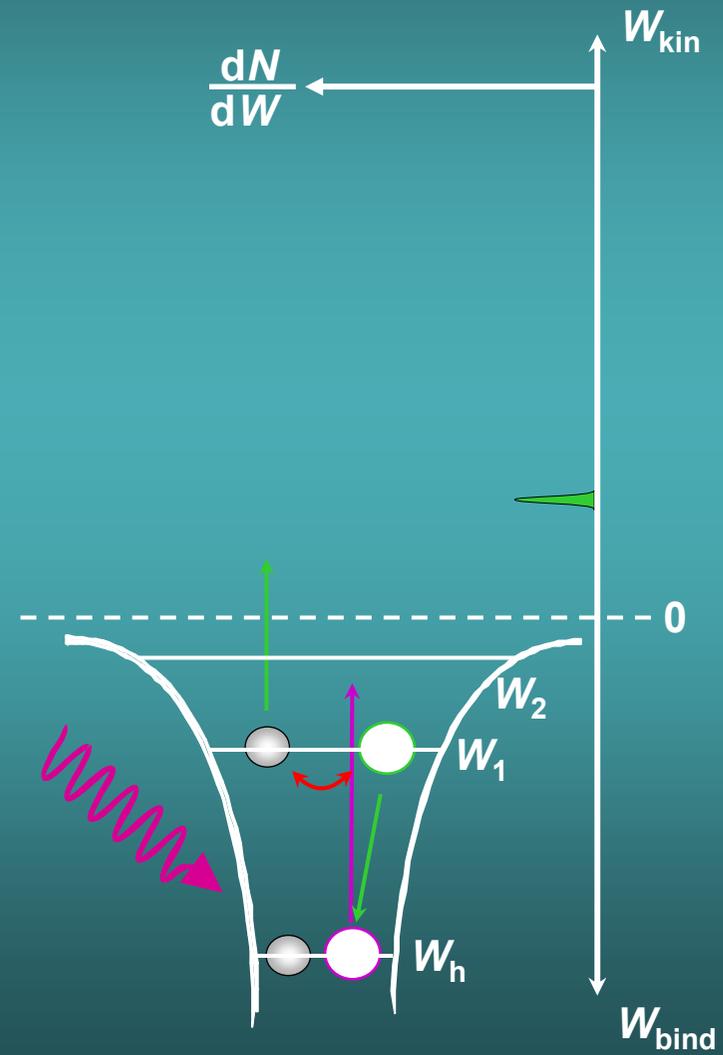
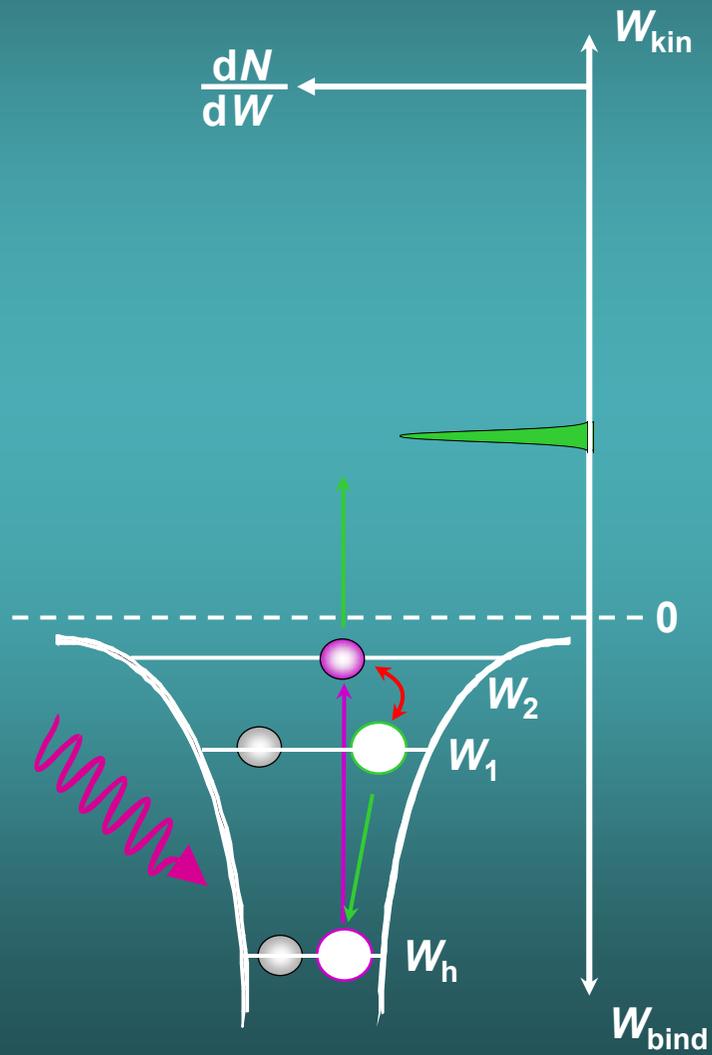
AUTUMN BOOKS
Why music matters
and how science is done

~140 attoseconds

3.) Presentation

Show something what entertains

Resonant photoemission



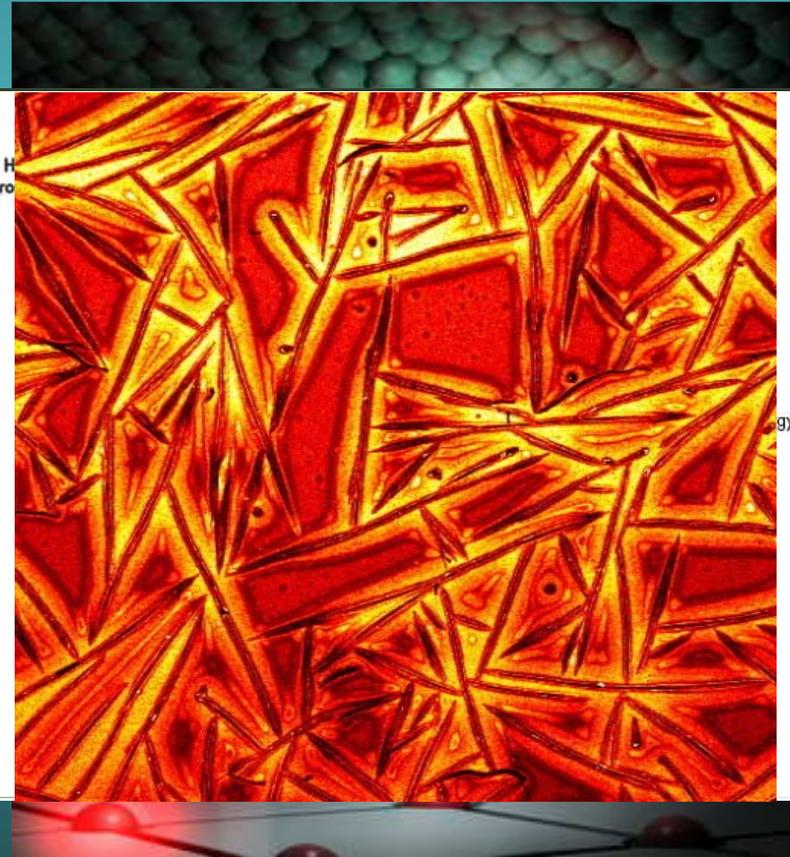
3.) Presentation

Show what for

Scientific relevance

Measuring / understanding and **control** of electronic processes in solids will probably have impact on:

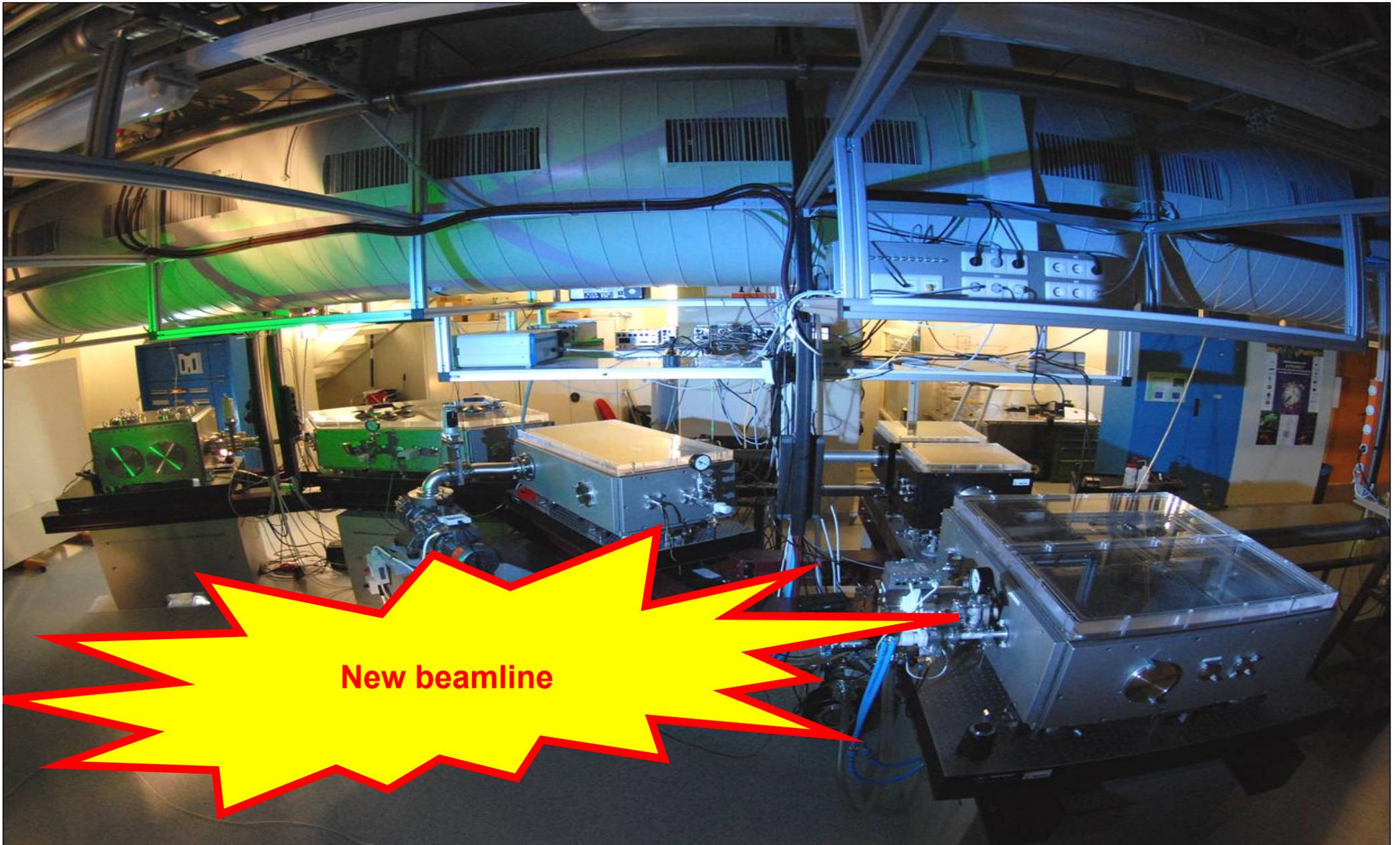
- **semiconductor and molecular electronics**
- **information processing**
- **photovoltaics**
- **electrochemical reactions**
- **optical nanostructuring**



3.) Presentation

**Show existing infrastructure
and where you want to build up something**

AS Beamlines

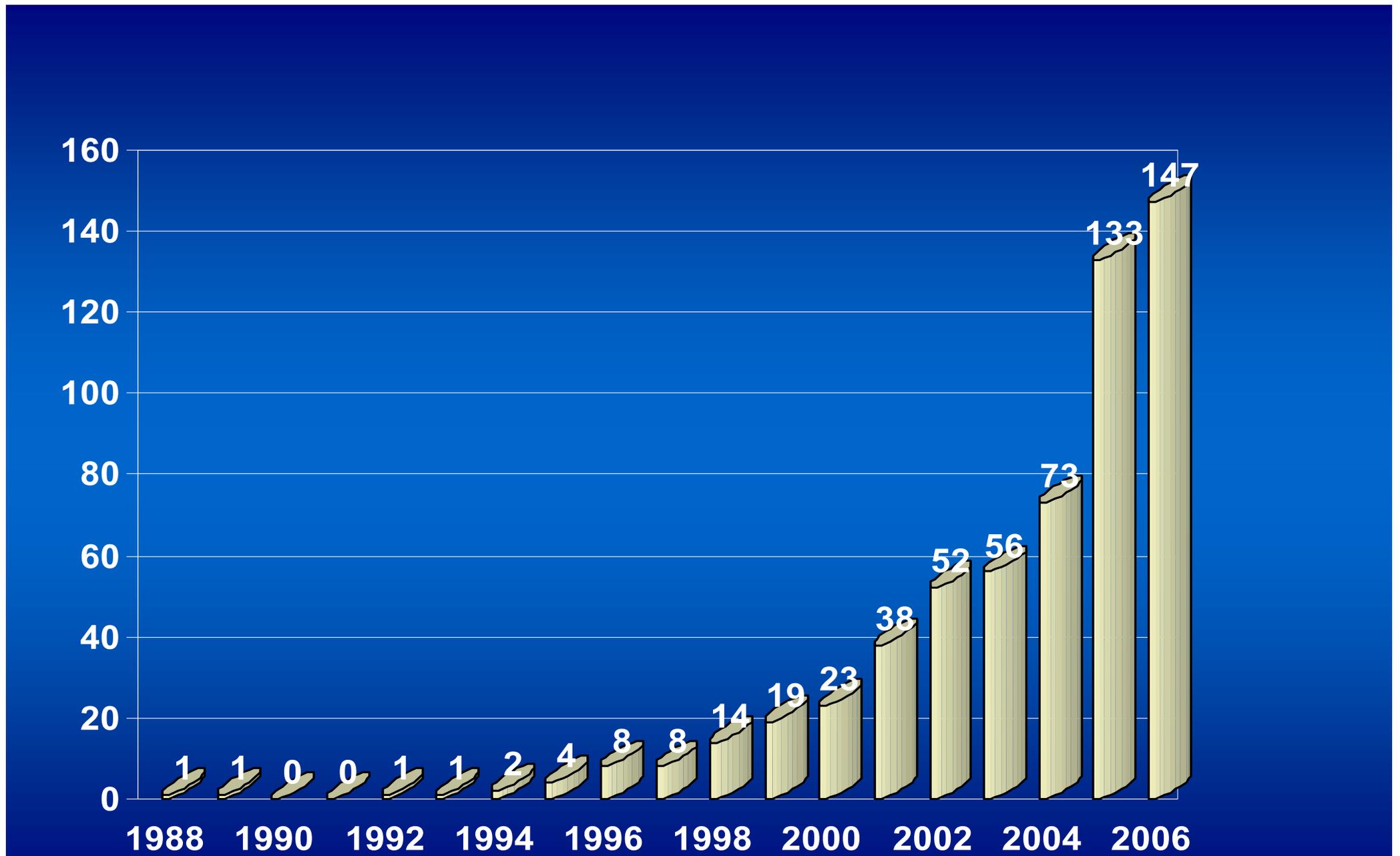


New beamline

3.) Presentation

Show the relevance of your proposal

Number of published 'attosecond' papers



Next steps

- **grant preparation form**
- **supplementary agreement**
- **commitment of the host institution**
- **account in trust needed!**

**Take care: this is some work
and deadlines are strict (and approaching very fast...)**

BUT:

In this stage I had great support from the EU office, (Ms. Epp)

THANKS!!!!

ERC

....Good luck!

and thanks for your attention.