

SPICE

Seismic wave **P**ropagation and **I**maging in
Complex media: a **E**uropean network

Welcome to Sudelfeld!



SPICE

Seismic wave **P**ropagation and **I**maging in
Complex media: a **E**uropean network

Thanks to

Erika - **everything**

Gilbert, Peter, Bernhard, Teresa - the drivers

Markus, Susanne, Jan, etc. etc.

The Löfflers for the hospitately



SPICE

Seismic wave Propagation and Imaging in Complex media: a European network

- Recap of the motivation for SPICE
- Related US initiatives (SCEC ITR, Geoframework, NSF, CCIG)
- A quick walk-through the SPICE-Tasks and schedule
- The EU contribution to each contractor
- The kick-off meeting program and expected results



Motivation

- There is a **wide gap** between theoretical/numerical and observational seismology
- Computational power is now such that 3D numerical approaches to wave propagation could enter **routine data fitting procedures** (e.g. source or structural imaging) or monitoring
- The **scientific value** of 3D simulation data is continuously increasing (e.g. earthquake scenario simulations, global wave propagation)
- There is **little or no infrastructure** supporting software development and large data volume handling in the Earth science community
- The community in computational seismology seems **fragmented**

Computational seismology on all scales

0.1m

- Lab scale (e.g. modelling high-frequency seismograms from fracturing experiments)

10km


- Volcano seismology, Reservoir wave propagation

100-1000km

- Dynamic rupture propagation, earthquake scenario simulation

>1000km

- Continental and planetary scale, global wave propagation



Related US initiatives with similar objectives

- **AGU Fall 2003 Town Meeting NSF**
identification of necessity for joint hardware and software infrastructure in the Earth sciences (Cohen, Erlebacher, Glatzmeier, Tromp)
- **NASA Solid Earth Science Working Group**
Vision for solid earth sciences for the next 25 years (Donellan, Ries, Rundle, Fox, Parker, Crippen, DeJong, Chao, Kuang)
- **Southern California Earthquake Center (SCEC-ITR)**
Information Infrastructure for Earthquake research, community modelling environment (CME), digital library (Jordan)
- **Center for Computational Infrastructure in Geodynamics (CCIG)**,
proposal stage (Gurnis, Kellog, Bloxham, Wyssession, Spiegelman)
- **Geoframework**
frozen code software repository (Gurnis, Tromp)
- **GEON**
A research project to create cyberinfrastructure for the geosciences (Seber)

Information on these projects is available for the group work



SPICE - The description of work

Task groups

- ***T1: www-interface, e-learning, dissemination, networking***
- ***T2: Storage, visualization, data contraction, archiving***
- ***T3: Benchmarks for multi-scale wave propagation and imaging***
- ***T4: SPICE - Planetary and continental scale***
- ***T5: SPICE - Local scale***
- ***T6: SPICE - Small scale***

Deliverables, Year 1+2

Del. Date (months)	Type	Subject	Resp.	Comments
1	M	Kick-Off Meeting	1	Meeting with the scientists-in-charge of all contractors to finalize project schedule
1	D	www - document	1	Project www-page with information on SPICE and advertisements for research positions
5	M	Special session	1,13	Special SPICE session I at EGU Meeting
10	W	Research and training	8,9	Research and Training workshop I
12	D	Periodic activity report	1	Report on network wide activity regarding finances, management, publications and other activities
12	D	www-document	1,10,14	Optimised algorithms for Cartesian wave propagation
15	M	Special session	3,5	Special SPICE Session II at International Meeting (e.g. EGU)
16	D	Proceedings	3,5	Abstract book and posters of Special SPICE session II
18	D	www - document	1	Teaching modules and course material, software archive
20	W	Research and training	10,14	Research and Training workshop II
24	D	Periodic activity report	1	Report on network wide activity regarding finances, management, publications and other activities
24	D	www-document	1,6	Formats for data storage; forward modelling archive
24	D	www-document	1,2,5	Algorithms for wave propagation on a planetary scale
24	D	www-document	10,13	Codes for topography, fractures, porosity

Deliverables, Year 3+4

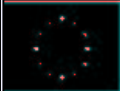
25	M	Mid-Term-Review	1,6	Mid-term-review meeting with scientific presentations and reports on network activities
30	D	www-archive	1,2	Archive with benchmark solutions
30	W	Research and training	4,5	Research and Training workshop III
36	D	www - document	1	Teaching modules and course material on R&T workshops
36	D	www-document	6,7	Tools for earthquake scenario simulations and dynamic rupture propagation
36	D	Periodic activity report	1	Report on network wide activity regarding finances, management, publications and other activities
40	D	www-document	1,6	Toolbox for data storage and visualization
40	M	Special session	11,3	Special SPICE Session III at International Meeting
42	D	Proceedings	11,3	Abstract book and posters of Special SPICE session III
44	D	www-document	2,5	Benchmark seismograms and models for imaging test
44	D	www-document	9,13	Tools for volcano seismology, reservoir modelling
44	D	www-document	2,3,5	High-resolution images, global and continental scale
46	M	Final meeting	1,2	Final meeting with presentation of scientific results and strategy for dissemination
46	D	Proceedings	1	Special issue on scientific results of SPICE, full articles (Deadline for submission month 46 with subsequent publication)
48	D	Periodic activity report	1	Report on network wide activity regarding finances, management, publications and other activities

SPICE Meetings

Year	Time	Duration	Resp. partner	Possible Locations / Comments / Participants
1	01/04	3 days	1	Spitzingsee, Germany / Kick-off Meeting / Leading scientists of SPICE and administrator
	05/04	Not applic.	1	Nice, France / EGU special SPICE session on <i>computational seismology</i> / SPICE and other researchers
	09/04	One week	8	Near Trieste, Italy / Open "Introductory school" Research and training workshop on <i>Fundamentals of numerical methods applied to wave propagation</i> / All SPICE researchers, invited speakers, invited students, other participants.
2	03/05	N.A.	3	Nice, France / EGU special SPICE session on <i>Multi-scale computational seismology</i> / SPICE and other researchers
	09/05	One week	10	Smolenice Castle, SK / Second Open Research and training workshop on <i>Large-scale simulations and computational aspects</i> / All SPICE researchers, invited speakers, invited students, other participants.
3	01/06	3-5 days	6	Davos, Switzerland / Mid-Term-Review Meeting / Leading scientists of SPICE, SPICE researchers, referees
	08/06	One week	5	Holland / Third Open Research and training workshop in <i>Inverse Problems in computational seismology</i> / All SPICE researchers, invited speakers, invited students, other participants.
4	04/07	N.A.	11	N.N. / EGU-EAGE special session. Scientific results of SPICE / SPICE and other researchers
	10/07	One week	2	Cargese, Corsica / Final, Multidisciplinary Meeting. Wrap-up and schedule for dissemination of results (e.g. PAGEOPH special issue, final WWW data base, etc.) / Leading scientists of SPICE, SPICE researchers, researchers from other disciplines.

There will be a *consortium meeting* at each workshop

SPICE - Money (e.g. Utrecht)

Contract Preparation Forms										
 EUROPEAN COMMISSION 6th Framework Programme on Research, Technological Development and Demonstration		Marie Curie Actions : Research Training Networks (RTN)							A5a	
Proposal Number ³		504267			Proposal Acronym ⁴ SPICE			Participant No. ^{1*}		5
Maximum Community Contribution per Participant ⁶²										
Year ²	Eligible expenses for the activities carried out by the researchers					Eligible expenses related to the activities of the host organisations				Maximum EC contribution (in euros)
	A Monthly Living Allowance	B Transnational Mobility		D Career Exploratory Allowance	E Participation expenses of the eligible researchers	F Research/training/transfer of knowledge	G Management and Audit Certification	H Overheads	I Other types of eligible expenses	
		B Travel Allowance	C Mobility Allowance							
Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	Costs (in euros)	
1	40287,23	2000,00	9039,30	4000,00	4800,00	15000,00	3000,00	8862,00	10500,00	97488,53
2	80574,45	2000,00	18078,60	0,00	9600,00	14000,00	3000,00	12925,00	2000,00	142178,05
3	48019,12	2000,00	11429,00	0,00	6400,00	7000,00	3000,00	7984,00	2000,00	87832,12
4	15870,73	1000,00	4052,10	0,00	2400,00	5000,00	3000,00	3132,00		34454,83
5	0,00	0,00	0,00	0,00	0,00					0,00
6	0,00	0,00	0,00	0,00	0,00					0,00
Total	184751,52	7000,00	42599,00	4000,00	23200,00	41000,00	12000,00	32903,00	14500,00	361953,52



Program

Monday 19th January

Morning

Opening:

- 9:00am The SPICE Network: Scope and Objectives, [Heiner Igel](#)
9:45am Discussion

Part I: The Partners

- 10:00am [Institut de Physique du Globe](#), Paris, [Jean-Paul Montagner](#)
10:10am [Istituto Nazionale di Geofisica e Vulcanologia](#), [Andrea Morelli](#)
10:20am [University of Oxford](#), [Arwen Deuss](#)
10:30am [University of Utrecht](#), [Jeannot Trampert](#)
10:40am [Swiss Federal Institute of Technology Zurich](#), [Domenico Giardini](#)
10:50am [Ecole Normale Supérieure](#), [Raul Madariaga](#)
11:00am [Istituto Nazionale di Oceanografia e di Geofisica Sperimentale](#), [Geza Seriani](#)
- 11:10am **Coffee Break**
- 11:30am [University of Naples "Federico II"](#), [Lapo Boschi](#)
11:40am [Comenius University](#), Bratislava, [Peter Moczo](#)
11:50am [Universitetet i Oslo](#), [Valerie Maupin](#)
12:00am [Universität Hamburg](#), [Torsten Dahm](#)
12:10am [National University of Ireland](#), [Chris Bean](#)
12:20pm [Charles University](#), Prague, [Johana Brokesova](#)
12:30am [Ludwig-Maximilians-Universität, München](#), [Heiner Igel](#)
12:40pm **Final discussion**



Program

Afternoon Part II: Defining key scientific and technical problems (RESEARCH)

- 2:00pm Definition of working groups (global seismology, strong ground motion, computational techniques, data base, etc.)
- 2:30pm Work in subgroups (joint projects, tasks, deliverables, etc.)
- 3:30pm **Coffee Break**
- 4:00pm Work in subgroups (joint projects, tasks, deliverables, etc.)
- 6:00pm End

6:30pm **Dinner**

Evening Administrative issues

- 8:00pm Reports and deadlines, financial issues, eligibility of candidates, responsibilities, management, auditing, **Erika Vye** and **Heiner Igel**

Program

Tuesday 20th January

Morning	International collaboration, associated experts
8:30am	Interfacing with observational seismology, data bases <u>Torild van Eck (ORFEUS)</u>
8:50am	Computational seismology in the industry, <u>Johan Robertson (Schlumberger)</u>
9:10am	Discussion
9:30am	Coffee Break
	Part III: Workshops and Training material (TRAINING)
10:00am	<u>Workshop I-III</u> outline and definition of subgroups
10:50am	Work in subgroups (Definition of training material, scheduling, organization)
13:00pm	Lunch (optional)
Afternoon	Skiing – Hiking – Curling – Sledging (weather permitting)
5:00pm	Mould wine – Hot Chocolate – Coffee
5:10am	Geodynamics and computational seismology, <u>Peter Bunge</u>
5:30pm	Presentations of each subgroup and discussion
7:00pm	End
Evening	
7:30pm	Bavarian evening, conference dinner

Tuesday afternoon





The Kick-off meeting

Expected Results

- ***Definition of (work-,task-,sub-)groups, members and leading scientist***
- ***Definition of key specific scientific questions that will be addressed and time plan***
- ***Definition of specific tasks of the groups, with name of scientists who will deliver***
- ***List of scientific and other software that will enter into the central library (date, author(s), type)***
- ***List of training/course material that will enter the digital library (topic, authors, date)***
- ***Specific definition of workshop I and II (lecturers, topics, training material, location, timing, organization)***

All this information should be delivered – after final discussions – by the groups (group leaders)



EXTENDED DEADLINE

***Special session on numerical
simulation of wave propagation***

EGU – Meeting, Nice 25.4.-30.4.2004

***EXTENDED DEADLINE
25 January 2004***

***The 2004 EGU Meeting will be important to
advertise the SPICE positions and
identify/interview candidates***