

Welcome!

20 full participants and 6 lecture attendants (20 nationalities representing institutes from 18 countries)

7 local Hamburg attendants (for lectures/tutorials only)

EMBL Outstation at DESY, Hamburg

1974

EMBL-Paradise

36 years later

DORIS

PETRA III

EMBL life sciences center at upgraded Petra-3 ring (construction started 2.07.2007 – you will see the progress today)

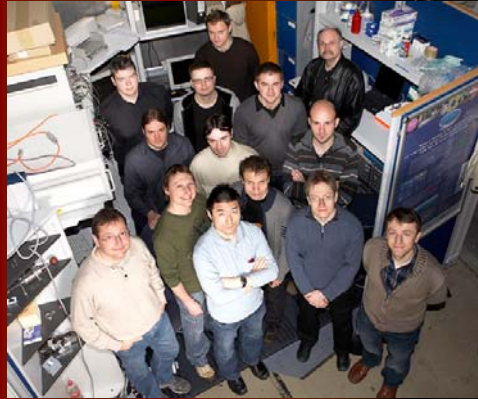
- 2 MX beamlines
- 1 BioSAXS beamline



Biological SAXS @ EMBL-HH



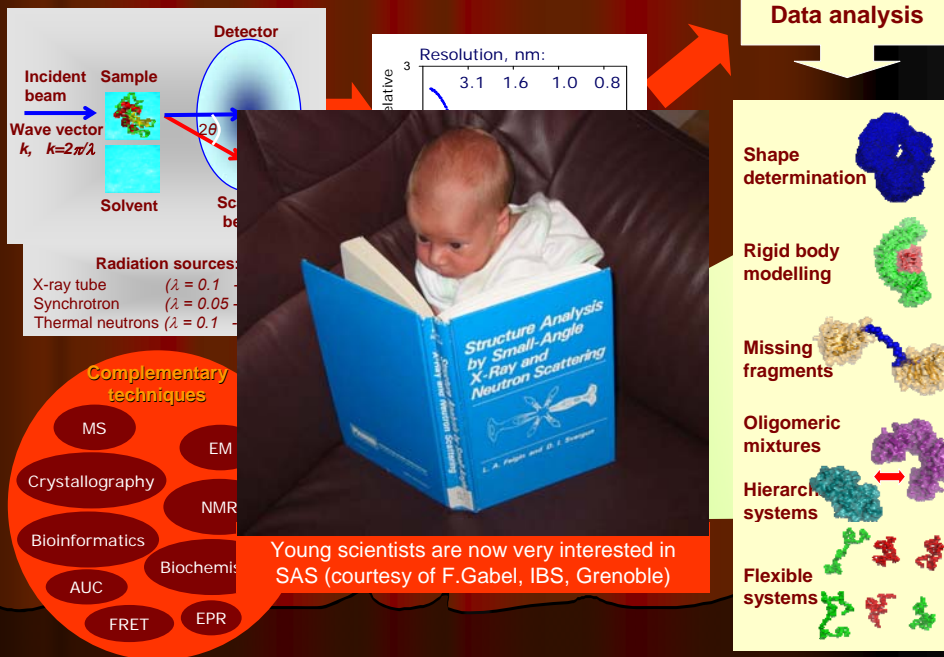
Group leader: D. Svergun
 Staff scientist: M. Petoukhov
 Petra-3 project leader: M. Roessle
 Staff with joint appointments:
 P. Konarev, D. Franke
 Postdocs: H. Mertens, W. Shang,
 M. Gajda, C. Gorba, C. Blanchet
 Predocs: A. Kikhney, A. Shkumatov,
 G. Tria, I. Danciu



Major tasks

- ❑ Running the X33 beamline
- ❑ User support and collaborative projects
- ❑ Development of data analysis methods
- ❑ Design and construction of the BioSAXS @ Petra-3 (in collaboration with the EMBL Petra-3 team)
- ❑ Education and training (including regular courses)

Small-angle scattering in structural biology



All new is well forgotten old

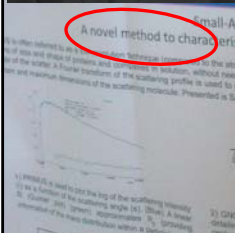


On finishing my university studies, in 1936, I obtained a post as assistant, which gave me the opportunity to work towards my thesis...

My "boss", who looked after my dissertation, ... was a crystallographer who kept an eye on my work rather distantly, but he did pass on a very good idea on me: to study, in addition to Bragg diffractions, diffuse scattering.

<He> asked me to make a camera with monochromatic primary radiation and with minimum parasitic radiation... That is why I studied especially small-angle scattering. I observed that ... the scattering is strong when the sample contains fine grains (10 to 100 nm).

I produced next the means of determining the grain size from the scattering curve. It was the beginning of X-rays small-angle scattering...



Guinier, A. (1939). "La diffraction des rayons X aux tres petits angles; application a l'etude de phenomenes ultramicroscopiques." Ann. Phys. (Paris) 12: 161-237.

When biologists go for SAS



Care for a shape?

This is just a trivial case:
You will learn that
SAXSMAN (© A.Kikhney)
yields much, much more



Schedule of the Course



- Day 1 : Basics of small-angle scattering (Mon 25 Oct)
- Day 2 : Data processing (Tue 26 Oct)
- Day 3 : *Ab initio* methods (Wed 27 Oct)
- Day 4 : Rigid body refinement (Thu 28 Oct)
- Day 5 : Mixtures and interacting systems (Fri 29 Oct)
- Day 6 : Applications and related methods (Sat 30 Oct)
- Day 7 : Future outlook, general discussion (Sun 31 Oct)
- Day 8 : General discussion, Departure (Mon 1 Nov)

Lectures and Practicals

- *Theory Seminars* (HASYLAB Seminar Room 109)
- *Software Demonstrations/Tutorials* (HASYLAB Seminar Room, PC, LCD projector)
- *Structural Biology Seminars* (HASYLAB Seminar Room)
- *Measurements of test samples* (SAXS X33 beamline, HASYLAB-3 experimental hall). Shutter permission and HASYLAB safety instructions are required.
- *Free Practicals and Data Analysis* (EMBL Seminar Room, 7 PC's and Library, 3 PC's)

The major threat for a Course



People are able to sleep at nearly any circumstances

SAXS Play Station IV (anti-sleeping pills)

- SAXS Bingo © M.Petoukhov

- SAXS Quest



Whom to ask

- **General questions:**
 - Dmitri Svergun (internal 125, mobile *127), Alexey Kikhney (170)
- **Organizational questions:**
 - Margret Fischer (internal 110, mobile 0175 4105 760)
 - Ivanka Araujo (183), EMBL secretary
- **Computer hardware:**
 - Daniel Franke (244)
- **Computer software:**
 - Maxim Petoukhov (177), Peter Konarev (224), Christian Gorba (113), Alexander Shkumatov (170)
- **SAXS measurements:** Manfred Roessle (192), Clement Blanchet (*150), Weifeng Shang (232)
- **Wetlab, samples:**
 - Haydyn Mertens (113), Michal Gajda (228)



Miscellaneous

- **Course photo:** October, 29th, lunch break
- **Sequence of measurements:** A list will be made by Manfred
- **Pairing for the Quest:**
 - A list will be compiled by Maxim
 - Quest run starts tomorrow
- **USB sticks:**
 - Contain at present ATSAS 2.3 distributive (for non-commercial participants)
 - Can be used to download Course materials from a Web repository
- **Own laptops:** In Room 109, DESY Guest network, in EMBL rooms, network 'passat' (MAC address must be registered, approach our computer group)
- **Your samples:**
 - You are responsible for them yourself-- ask Haydyn for help
 - Minimize the use of the Wetlab, most facilities are available at the beamline!
- **Your presentations:**
 - 26 participants, (with or without PPT, as you wish)
 - A total of 10 minutes per participant (7 min talk + 3 min questions)