

Chair of Drilling and Completion Engineering

Montanuniversitaet Leoben

presented by

Abbas Roohi

November 12nd 2014

Presentation Outline

- Lecture Program
- Industry Cooperation
- Research Activities
- Industrial Application
- Tour of Facilities

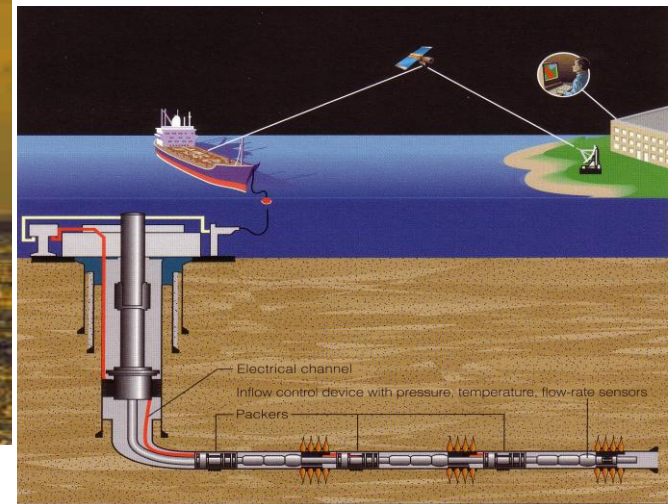
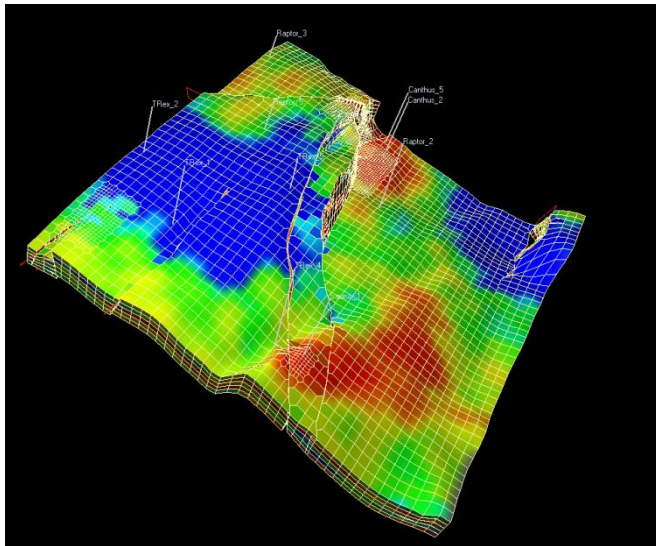


Lecture Program

Drilling Engineering

Production Engineering

Reservoir Engineering



Geology and Geophysics

Petroleum Engineering Programm		
7 Semester Bachelor Program	4 semester Basic Courses <ul style="list-style-type: none"> √ Mathematics, Numerical Mathematics, and Programing √ Chemistry √ Physic √ Mechanical Engineering & Electrical Engineering √ Economics √ Geology 	
	3 Semester Petroleum Engineering Courses <ul style="list-style-type: none"> √ Geosciences and Geoengineering √ Reservoir Engineering √ Production Engineering 	
3 Semester Master Program	Petroleum Engineering <ul style="list-style-type: none"> √ Advanced Fundamentals √ Geosciences 	Industrial Management & Business Administration <ul style="list-style-type: none"> √ General MBA √ Petroleum Business
	Modules in <ul style="list-style-type: none"> √ Reservoir Engineering √ Drilling Engineering √ Production Engineering 	Modules in <ul style="list-style-type: none"> √ Sustainability Management √ Facility Management √ Knowledge Management √ Process and Quality Management
6 Semester PhD Program	Individual Research Work	

Commitment to Education as Generic Petroleum Engineer

- Possesses solid knowledge in all basic, classical subjects
- Masters geology and geophysics
- Highly professional competence in the areas of
 - **Reservoir**
 - **Drilling**, and
 - **Production Engineering**
- Possesses practice-oriented knowledge of applied economics and management.

Curriculum Development Strategy

- Specify and communicate clear expectations for skill set to be developed by students
 - Concepts as guideline through student career
- Combine deep understanding of first principles with practical work in labs
 - Fluids, mechanical and electronics laboratory work
- Conduct integrated field development projects
 - Field measurements – geological model – reservoir model field development concept
 - Use of state of the art software tools
- Strengthen soft skills
 - Presentation

Program Strengths

- Involving people from industry in teaching (external lecturers),
- The completion of a compulsory internship by students,
- Including industry-related, practical examples and problems in lectures,
- Arranging excursions and industry projects (company seminars)
- Students writing their “Masters Thesis“ in cooperation with industry.

LECTURE PROGRAM

DRILLING ENGINEERING

Curriculum managed by the Chair of Drilling and Completion Engineering



Drilling Curriculum Bachelor Program

PE-Bachelor Programm - Drilling Courses		
Semester 5	Drilling Engineering and Well Design VO 3 SSt / 3.5 ECTS	Drilling engineering and Well Design Practical UE 2 SSt / 2 ECTS
Semester 6	Completion Engineering and Well Design VO 2 SSt / 2.5 ECTS	Completion Engineering and Well Design Practical UE 2 SSt / 2 ECTS
Semester 7	Well Placement IV 2 SSt / 2.5 ECTS	Bachelor Thesis


Drilling Curriculum Master's Program

Semester 1	Metallurgy and Corrosion for Petroleum Engineers VO 2 SSSt / 3 ECTS	Advanced Drilling Technology Practical UE 3 SSSt / 4 ECTS	
	Well Construction Equipment VO 2 SSSt / 3 ECTS		
	Offshore Technology IV 3 SSSt / 4 ECTS		
	Advanced Drilling Technology VO 3 SSSt / 4.5 ECTS		
Semester 2	Measurement Control, Monitoring and Analysis VO 2 SSSt / 3 ECTS	Well Construction Problems and Solutions PS 2 SSSt / 4 ECTS	
	Drilling Process Evaluation and Planning IV 2 SSSt / 3 ECTS	Measurement Control, Monitoring and Analysis Lab UE 1 SSSt / 1 ECTS	
	Advanced Well Completions VO 3 SSSt / 3 ECTS	Well Construction Fluids Lab IV 2 SSSt / 3 ECTS	
	Well Testing Operations IV 1 SSSt / 1.5 ECTS	Well Construction Mechanical Lab IV 2 SSSt / 3 ECTS	
	Oil and Gas Facilities VO 2 SSSt / 3 ECTS		
	Well Control IV 2 SSSt / 3 ECTS		
Semester 3	Master Thesis		

Industry Cooperation

- **OMV invested more than 20 million Euros in MUL as the target to double the graduates**

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OMV and Montan University are launching a new master program

OMV and Montan University are launching a new Master's degree in autumn 2014. Theory and practice will come together in interdisciplinary projects. Management skills such as a foundation in economics and communication will be taught alongside health and safety and a responsible approach to society and the environment. The new Master's degree program will offer cutting-edge educational approaches combined with practical industry expertise. The





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Research Programs

Drilling Monitoring and Analysis

Extending the Drilling Envelope

Environmental Friendly Drilling

RESEARCH PROGRAM

DRILLING MONITORING AND DIAGNOSES

Program to enhance real-time monitoring and analysis of well construction operations and well performance

Research Project

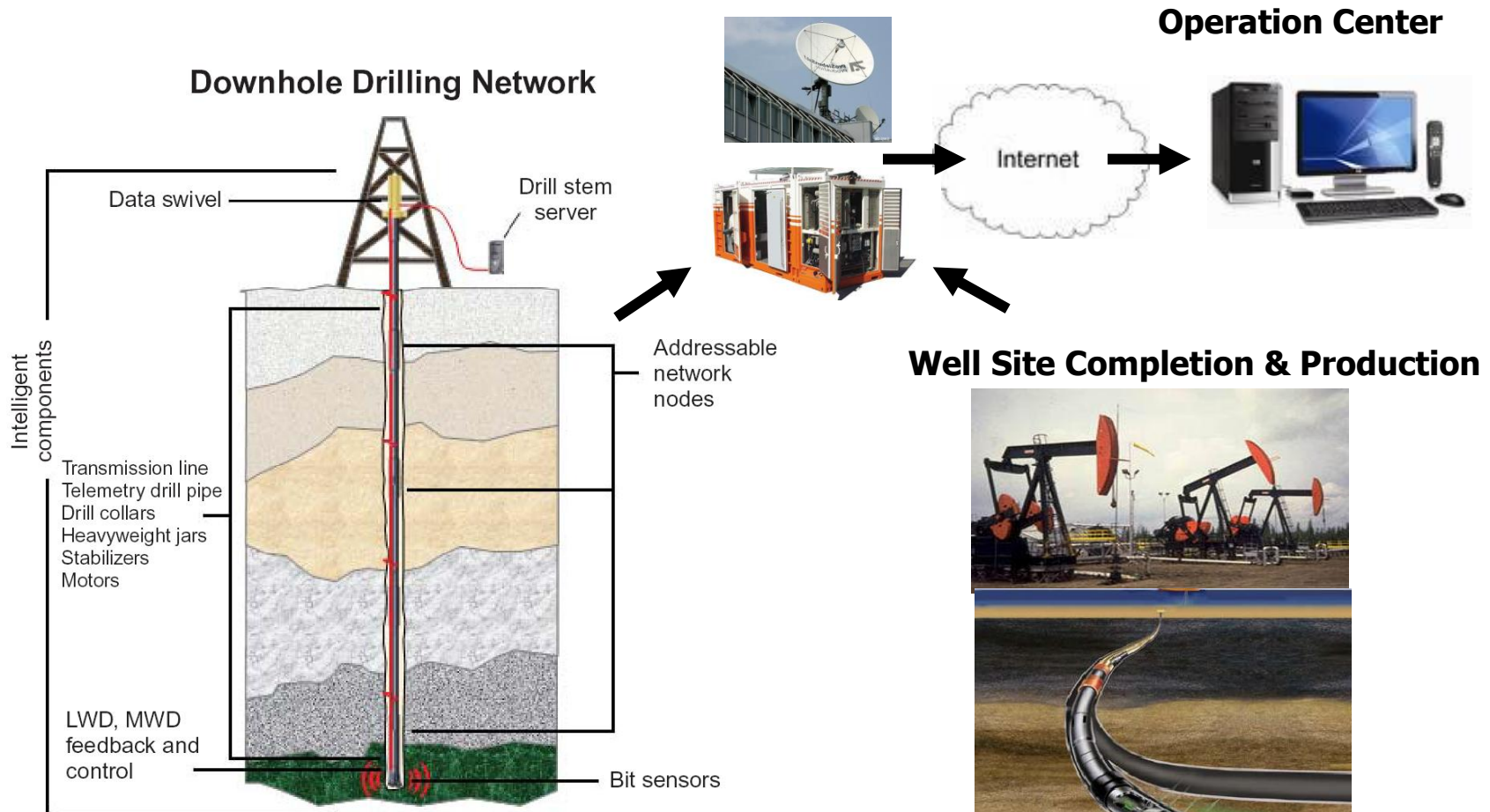
“Downhole Drilling Monitoring and Analysis System”

Develop of an integrated system to perform down-hole measurements and analysis

Project Partners



Communication from Bit to Operations Center



Michael J. Jellison, David R. Hall, Mike L. Payne, and R. Brett Chandler
"Open New Possibilities in Drilling Field Development"

RESEARCH PROGRAM

EXTENDING THE DRILLING ENVELOPE

Program to extend the drilling envelope in terms of depth, departure, hole sizes etc.

Research Project “*Composite Drill Pipe*”

Developing an ultra-light drill string to reach targets
with departures beyond 17 km

Project Partners



StatoilHydro

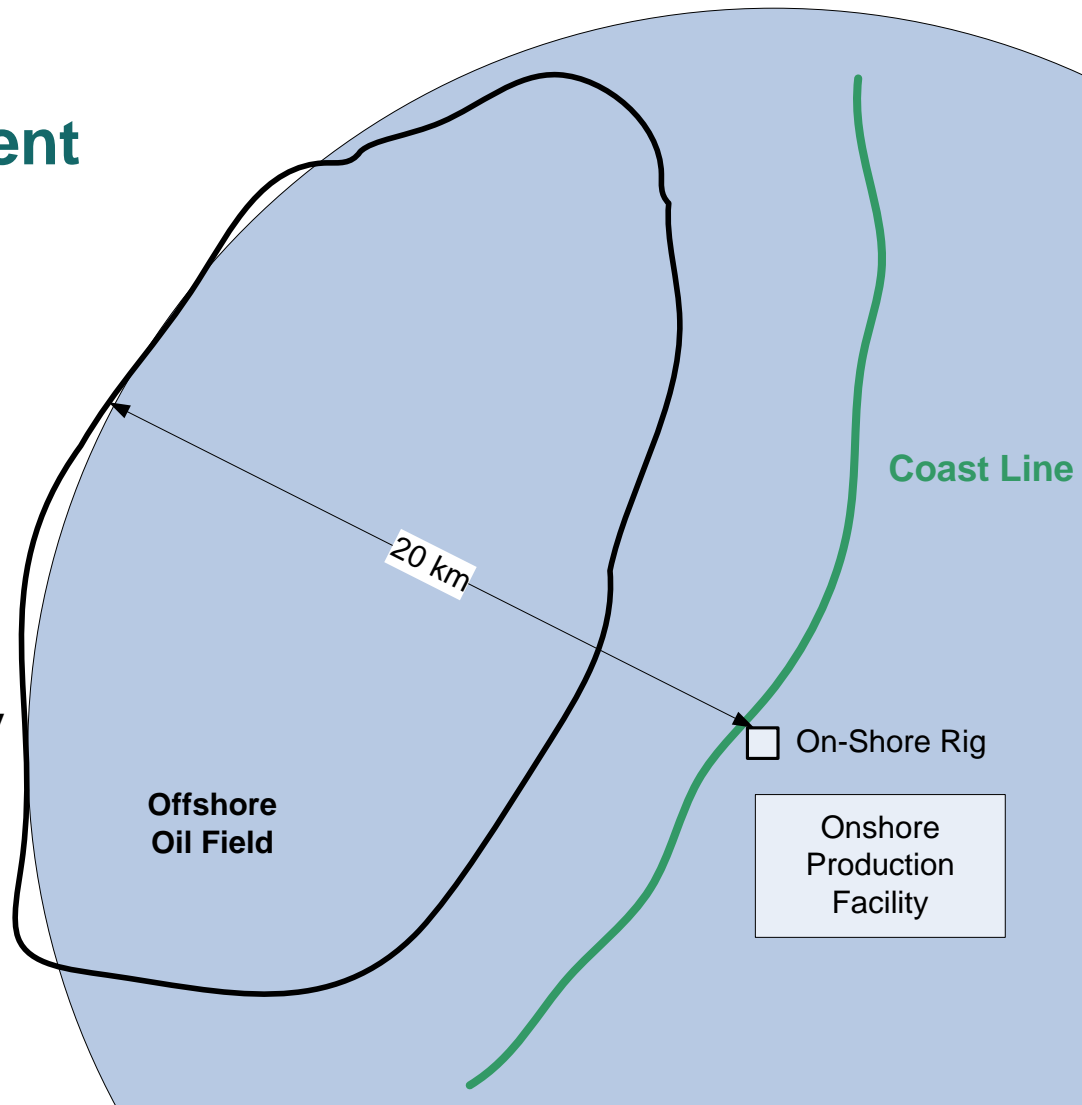
Think & Vision
member of TDE Group



New Field Development Alternative

Challenges

- Weight/tensile ratio
- Torsion resistance
- Wear
- Hydraulics
- Surface to down-hole communication and power supply
- Temperature
- Compatibility with hostile environments (H_2S , CO_2)



**RESEARCH PROGRAM
ENVIRONMENTAL
FRIENDLY DRILLING
(EFD) EUROPE**



Program to minimize environmental footprint of well contraction operations.

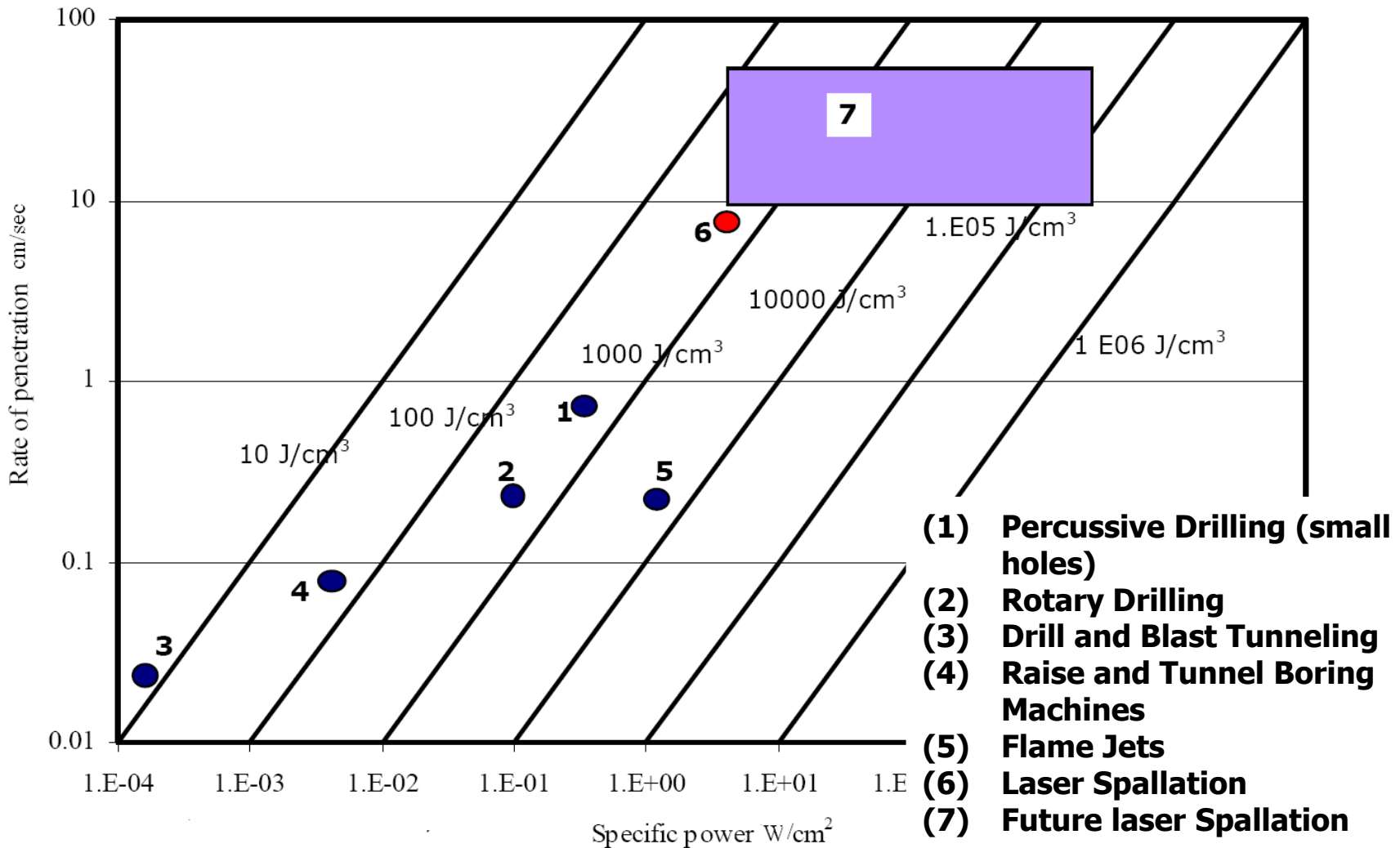
Research Project *“Energy Efficient Drilling Methods”*

Developing an understanding of the physics of alternative drilling methods in the search for alternatives to rotary drilling

Project Partner



A Comparison of Various Drilling Techniques



Research Project *“Energy Efficient Rig”*

Research project to determine optimum rig to drill with highest possible energy efficiency

Project Partners



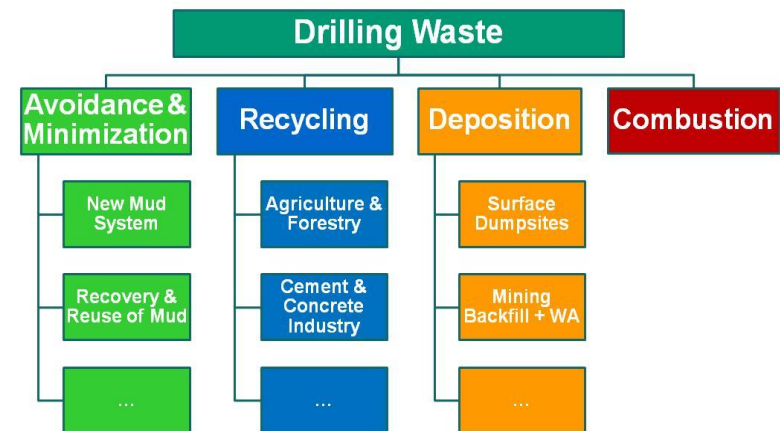
ENVIRONMENTAL FRIENDLY DRILLING (EFD) EUROPE



Drilling in Central The Hague



Management of Drilling Emissions



Research Project *“Environmental Friendly Mud System”*

Research project to develop concept to minimize mud and cuttings disposal. Current focus on TOC content

Project Partners

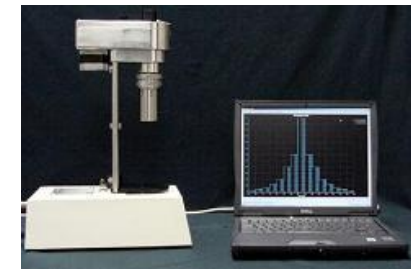


RAG.AUSTRIA.ENERGY

CDC miniRig



Fluids Lab



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