

PUMPS & PIPES
NORWAY

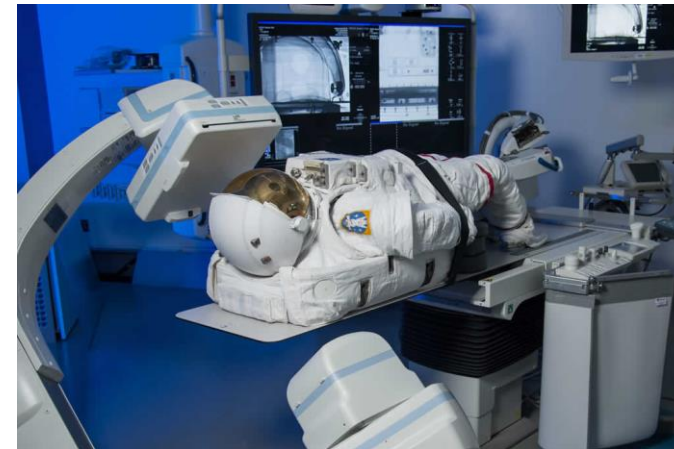
Norway Pumps & Pipes – Cross-industry collaboration

3rd Joining Forces Seminar – NPD, Stavanger, 19th – 20th April 2018

Thor Ole Gulsrud, PhD, Research Director – Medtech, IRIS



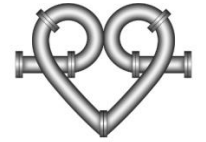
Pumps & Pipes – the story



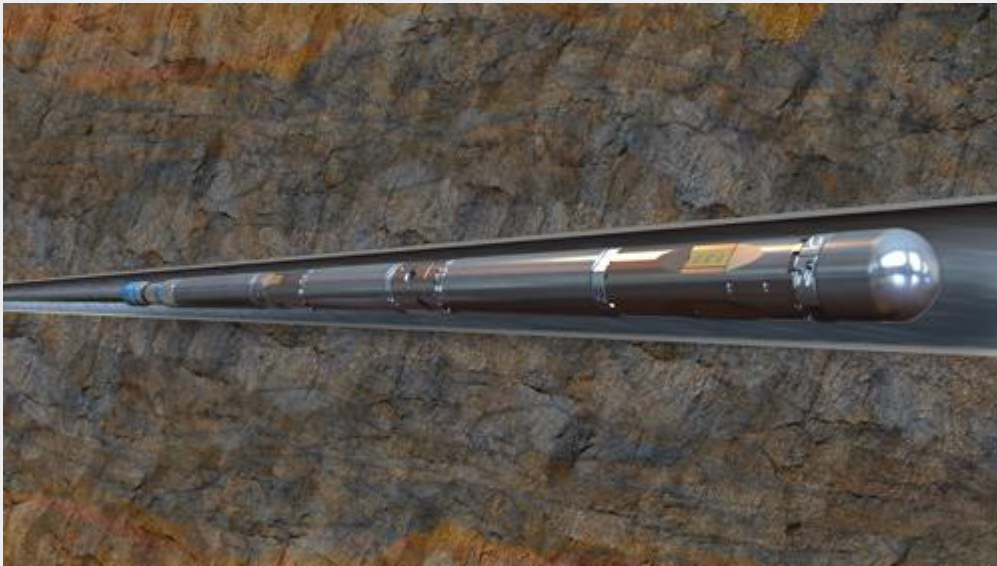
The solution to your problem may very well be in «The Other Guy's Toolkit»



Similar challenges – different approaches

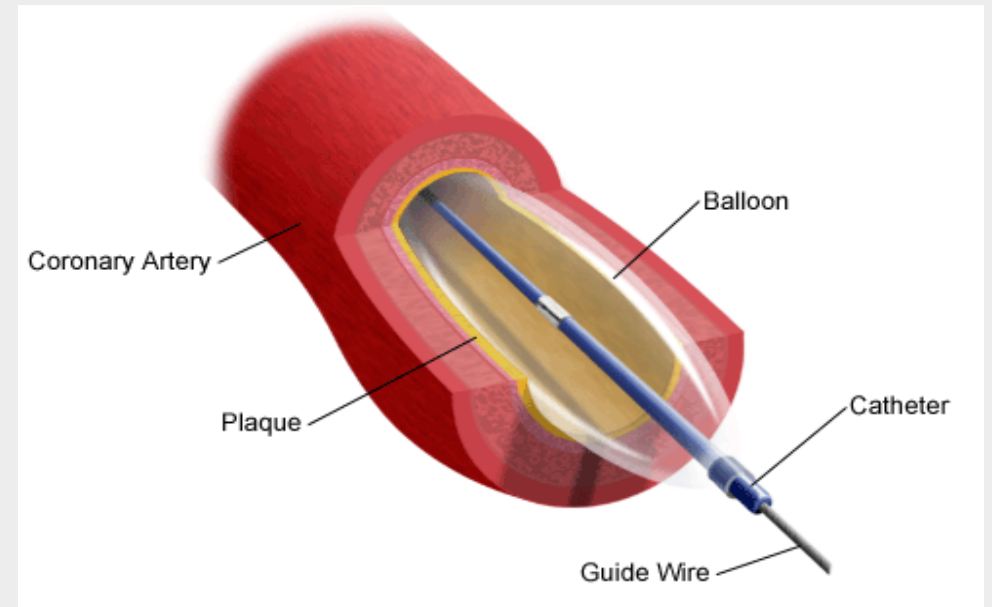


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Schlumberger ACTIVE DFLO CT real-time flow measurement tool

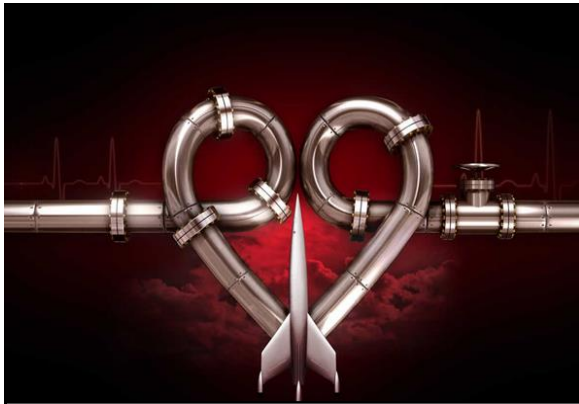
Well intervention



Hackensack University Medical Center

Cardiac intervention

Norway Pumps & Pipes



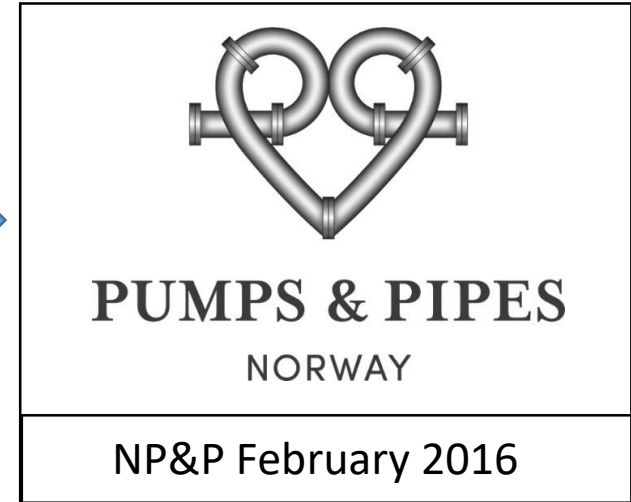
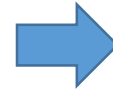
Inspiration from Houston

www.pumpsandpipes.com



MNOK 5 from NMHCS*

*Norwegian Ministry of Health and Care Services



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Norway Pumps & Pipes



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Main activities:

- Regular lunch-seminars.
- Workshops on different topics.
- Promote cross-industry collaboration to solve challenging problems.
- Seed funding of projects (in 2016 and 2017).
- First conference will be organized in 2018.





Project example 1: Non-invasive FFR-measurement

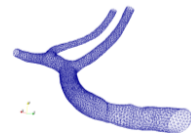
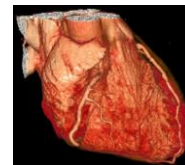
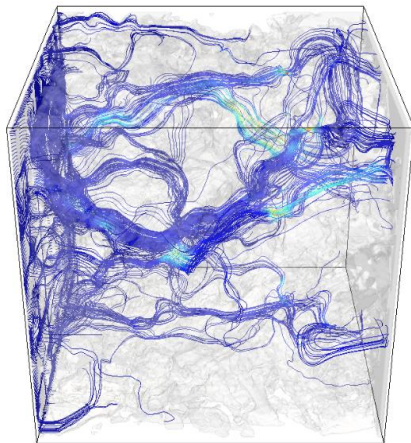
Challenge from the cardiologists:

- Calculate how much a given stenosis affects the supply of oxygen to the heart.

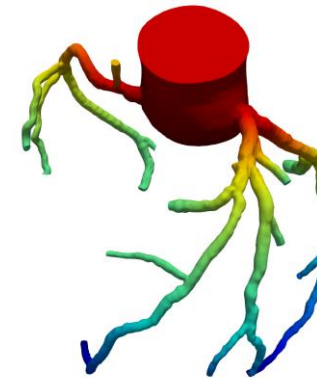
Project:

- Non-invasive assessment of the coronary arteries based on data modelling and medical imaging.

Flow model for Enhanced Oil Recovery



Non-invasive FFR-measurement



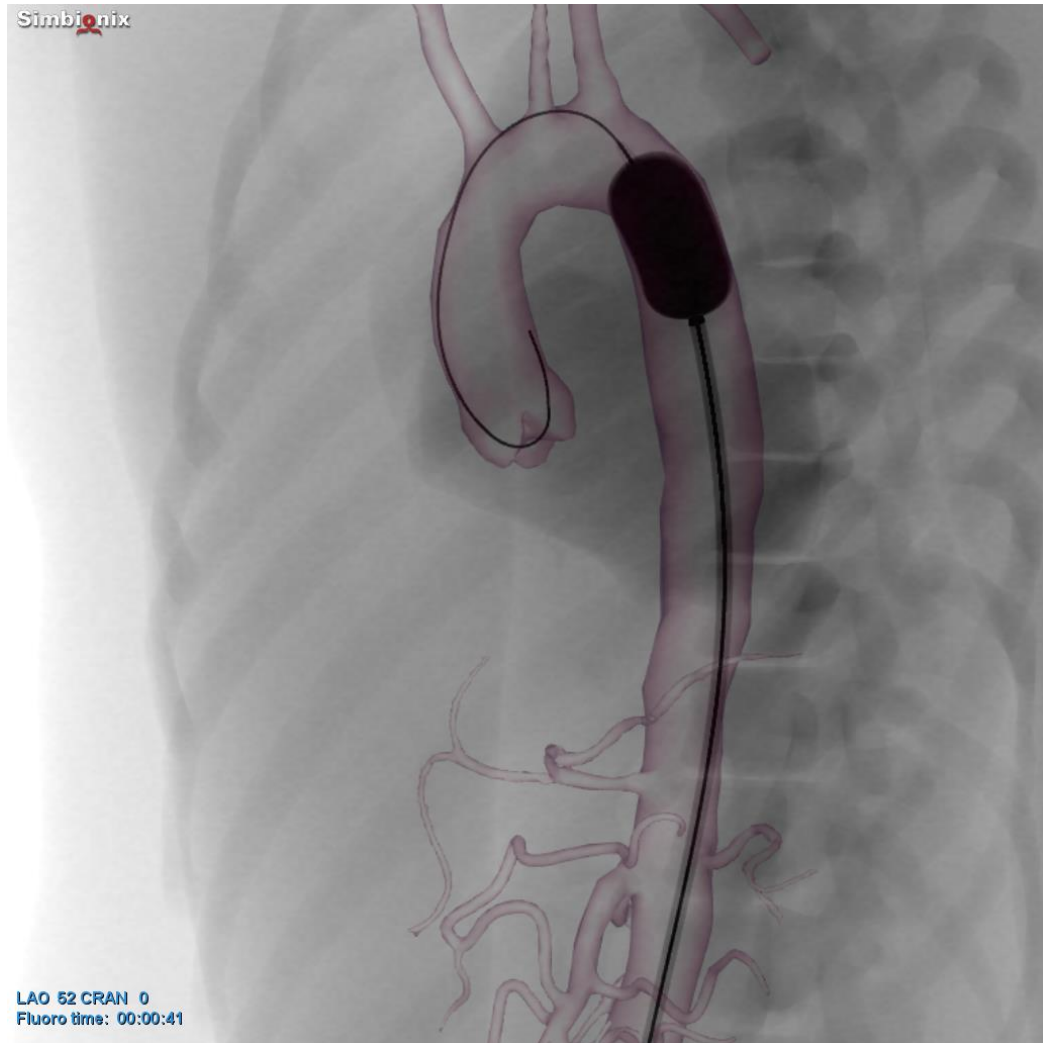
$$\rho \left(\underbrace{\frac{\partial \mathbf{v}}{\partial t}}_{\text{Unsteady acceleration}} + \underbrace{(\mathbf{v} \cdot \nabla) \mathbf{v}}_{\text{Convective acceleration}} \right) = \underbrace{-\nabla p}_{\text{Pressure gradient}} + \underbrace{\mu \nabla^2 \mathbf{v}}_{\text{Viscosity}} + \underbrace{\mathbf{f}}_{\text{Other forces}}$$

Project example 2:

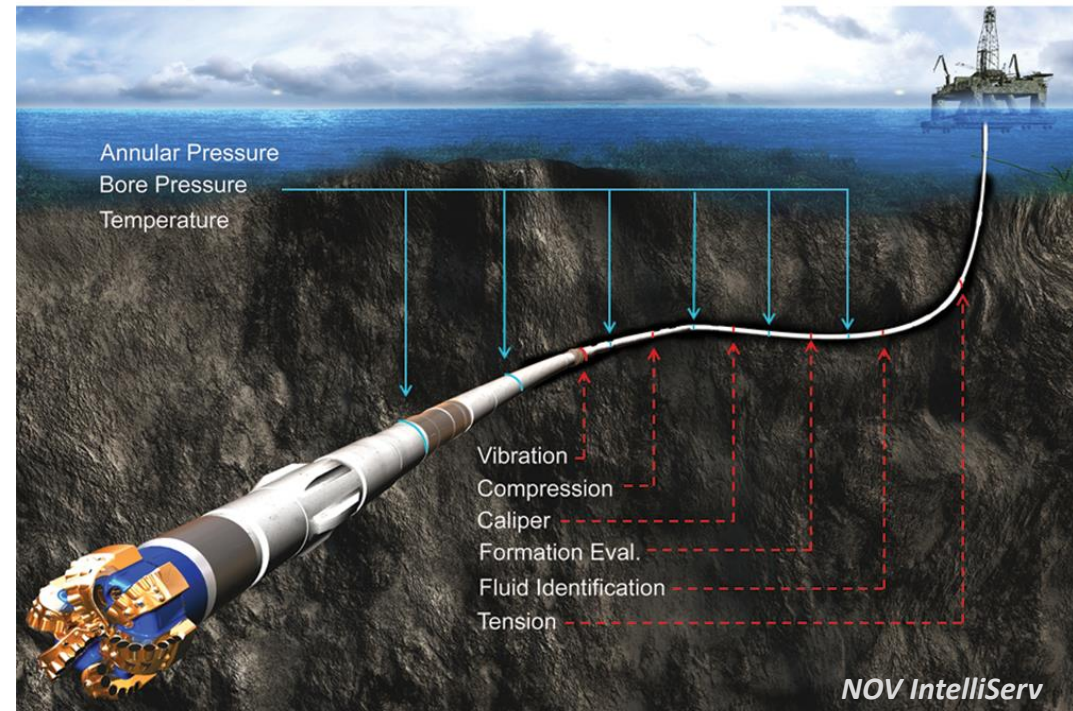
Resuscitative Endovascular Balloon Occlusion of Aorta (REBOA)



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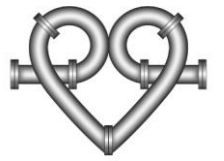
- REBOA is a technique that stops the internal bleeding by inflating a balloon inside the aorta.
- Can the catheter be equipped with sensors that register different vital parameters such as blood pressure and oxygen content?





From “Ullrigg” to “Ullrik”

Norway Pumps & Pipes 1st Annual Conference, Stavanger 17.-18th of October 2018



PUMPS & PIPES
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1ST NORWAY PUMPS & PIPES CONFERENCE

OCTOBER 17-18, 2018, SOLA STRAND
HOTEL, SOLA, NORWAY

We are delighted to invite you to
attend this very first Norway Pumps &
Pipes Conference.

[Read more here!](#)

Conference theme: Cross-industry Collaborations

- Call for abstracts - deadline June 20th
- Explore and promote unique innovation possibilities between oil & gas and medicine.
- Share competence and challenges.
- Highlight new solutions and innovations.

Confirmed!



Alan B. Lumsden, MD

Walter W. Fondren III Distinguished Endowed Chair, DeBakey Heart & Vascular Center
Chair, Department of Cardiovascular Surgery
Professor of Cardiovascular Surgery, Institute for Academic Medicine
Full Clinical Member, Research Institute
Houston Methodist
Weill Cornell Medical College

Thank you for your attention!

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