



Program for folkeskolelærerkurset 8-9/9 2011

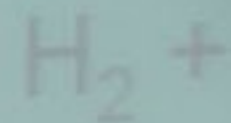
Torsdag 8/9 (Audtoriet)

09:00: Ankomst og morgenmad
09:30: Førelsepræsentation – hvad er katalyse? (KJØ)
10:30: Klima og energi – ngtg og føderet (KJØ)
11:30: Præsentation af BivKlog.dk (Jesper Tegen)
12:00: Frokost
13:00: Brændstoffer – hvad og hvordan – nu og
14:30: Aflevering af olie: En praktisk opgave (JUU)
17:00: Aftenbuffet
20:00: Slut

Freitag 9/9 (533+534/Audtoriet)







Andre

Naturgas: CH

CH

Ammoniak:



Fyld en reaktor spillet

Grading	Navn	Effektivitet			Pris	Antal klodser (pris for load)	
		Distribution	Filtrering	Filterkapacitet			
TK-10	TK-10	+++	+++	Høj	7	2 (14)	
	TK-15	+++	++	Høj	4	3 (12)	
	TK-25	++	++	Meget høj	10	3 (30)	
	TK-30	++	+	Mellem	2	5 (10)	
Guard	Navn	Effektivitet			Pris	Antal klodser (pris for load)	
		Fjerne Ni	Fjerne V	Fjerne As			
TK-45	TK-45	-	-	++	2	4 (8)	
	TK-47	-	-	+++	5	2 (10)	
	TK-743	+++	+++	+	7	2 (14)	
	TK-831	++	++	+	3	4 (12)	
Bulk	Navn	Pris	Antal klodser (pris for load)		Pris	Antal klodser (pris for load)	
			--1000 ppm S	--10 ppm S			
TK-527	TK-527	3	10 (30)	-			
	TK-561 BRIM™	5	7 (35)	12 (60)			
	TK-605 BRIM™	8	5 (40)	10 (80)			
	TK-605 BRIM™	10	4 (40)	9 (90)			
Bulk	Navn	Pris	Antal klodser (pris for load)		Pris	Antal klodser (pris for load)	
			Krakning og cold flow	Farve			
TK-527	TK-527	12	10 (120)	10 (120)			
	TK-527	12	10 (120)	10 (120)			
	TK-527	13	10 (130)	10 (130)			
	TK-527	14	10 (140)	10 (140)			
TK-527	TK-527	10	20 (200)	4 (40)			













CASE

Catalysis for Sustainable Energy

Energi, brændselsceller og katalysatorer

CASE-HTAS kursus
8.-9. september

ANNE HANSEN, ASSOCTERET LEDER, CASE, DTU



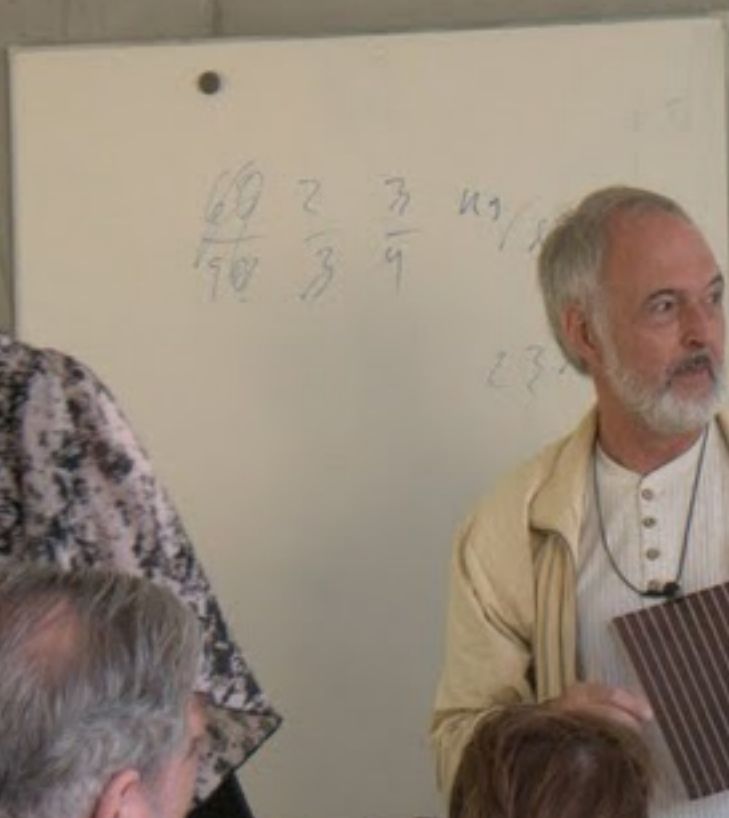






Kap. 3: Verdens bedste energikilde

CASE forskningen beskrevet på side 59-61





Kap. 3: Verdens bedste energikilde

CASE forskningen beskrevet på side 59-61

Solenergi

elektrisk energi

Kemisk energi



$\frac{h}{m\lambda}$

23 MW



energikilde
CASE forskningens bes

Solenergi

Elektrisk
energi

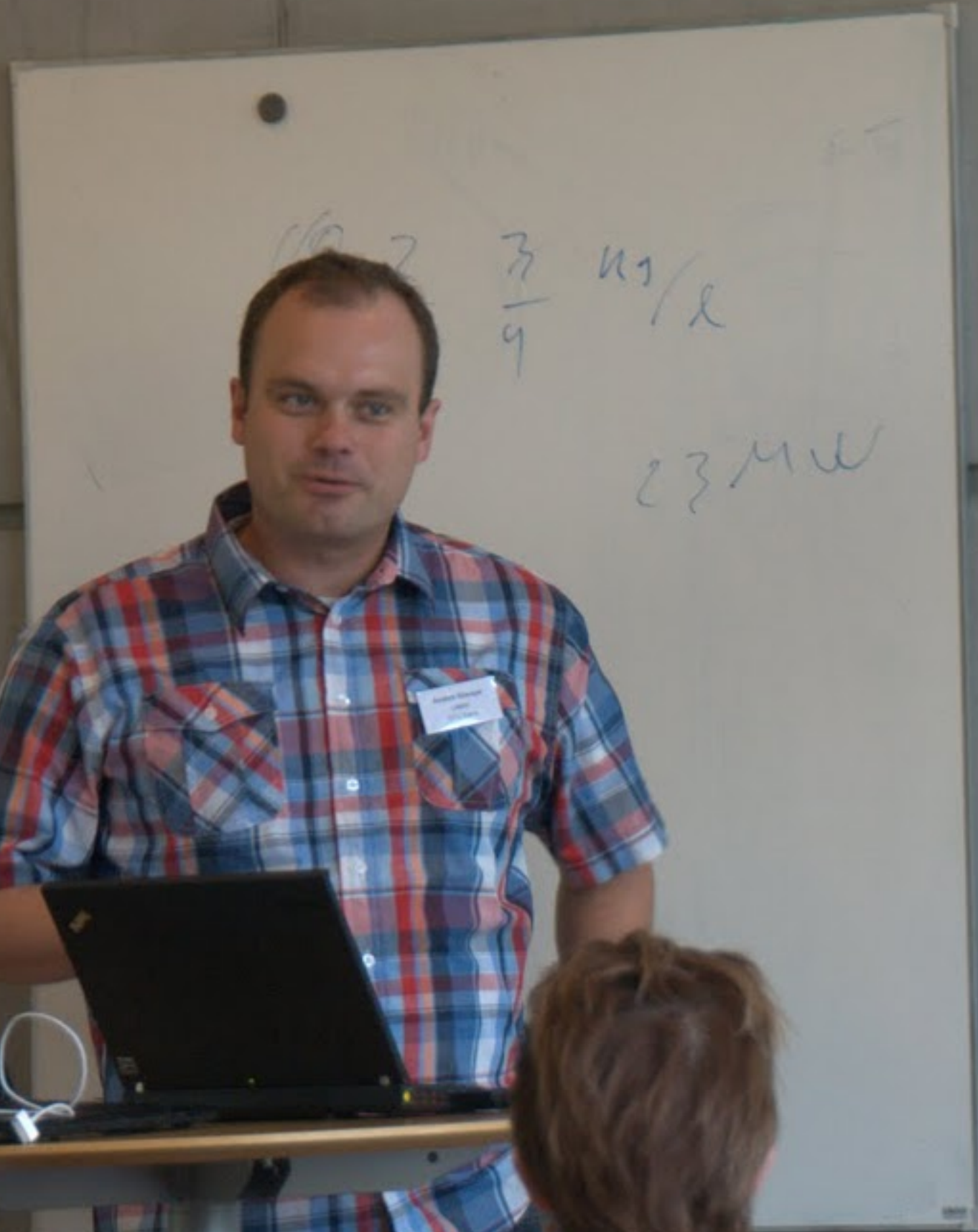


Arvid Gull
Lektor
Fysikk

CASE

Energi fra biomasse

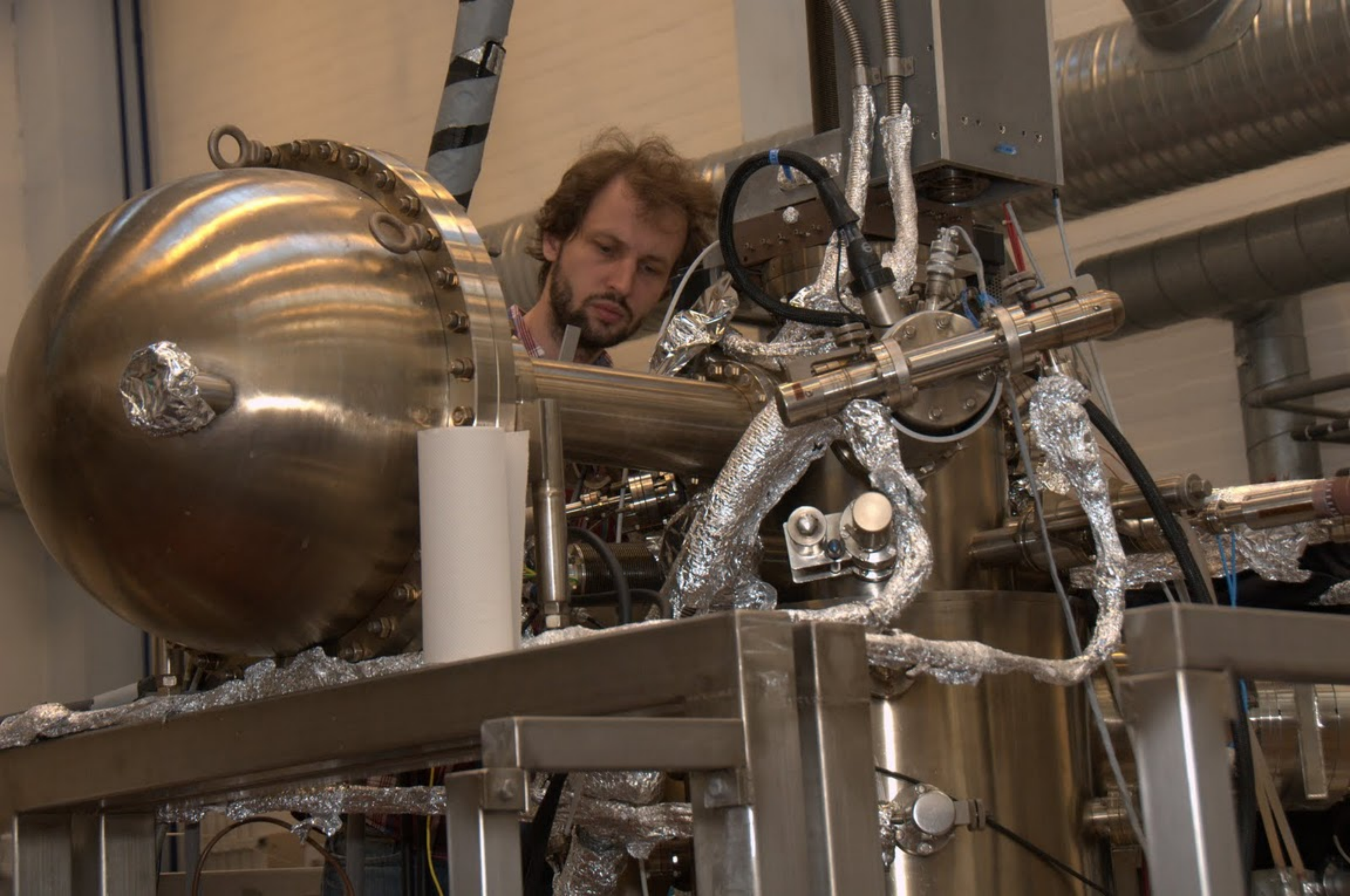




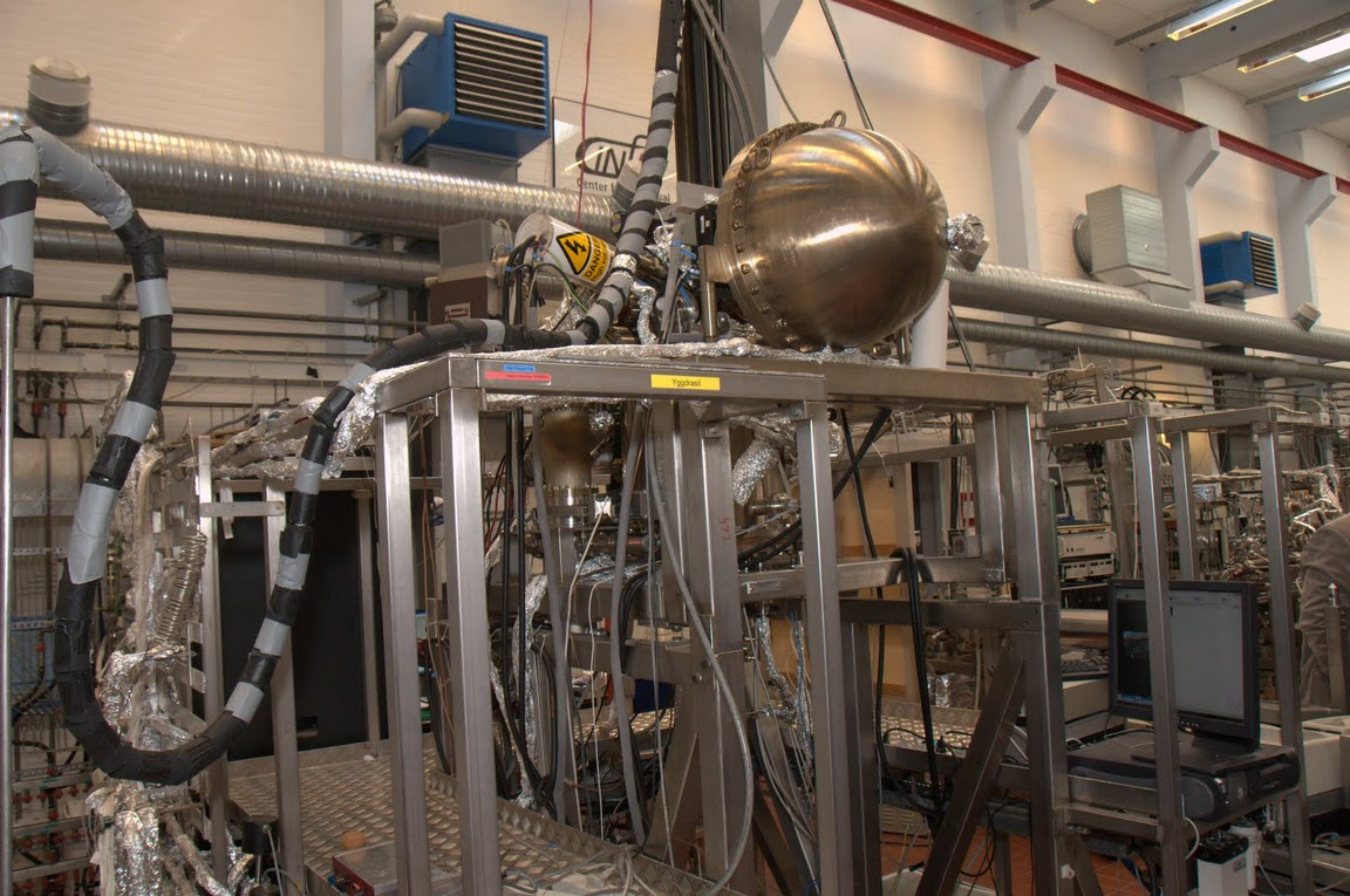
- ved fotosyntese
- Nuværende fo
- Livscyklus for
for olie er me

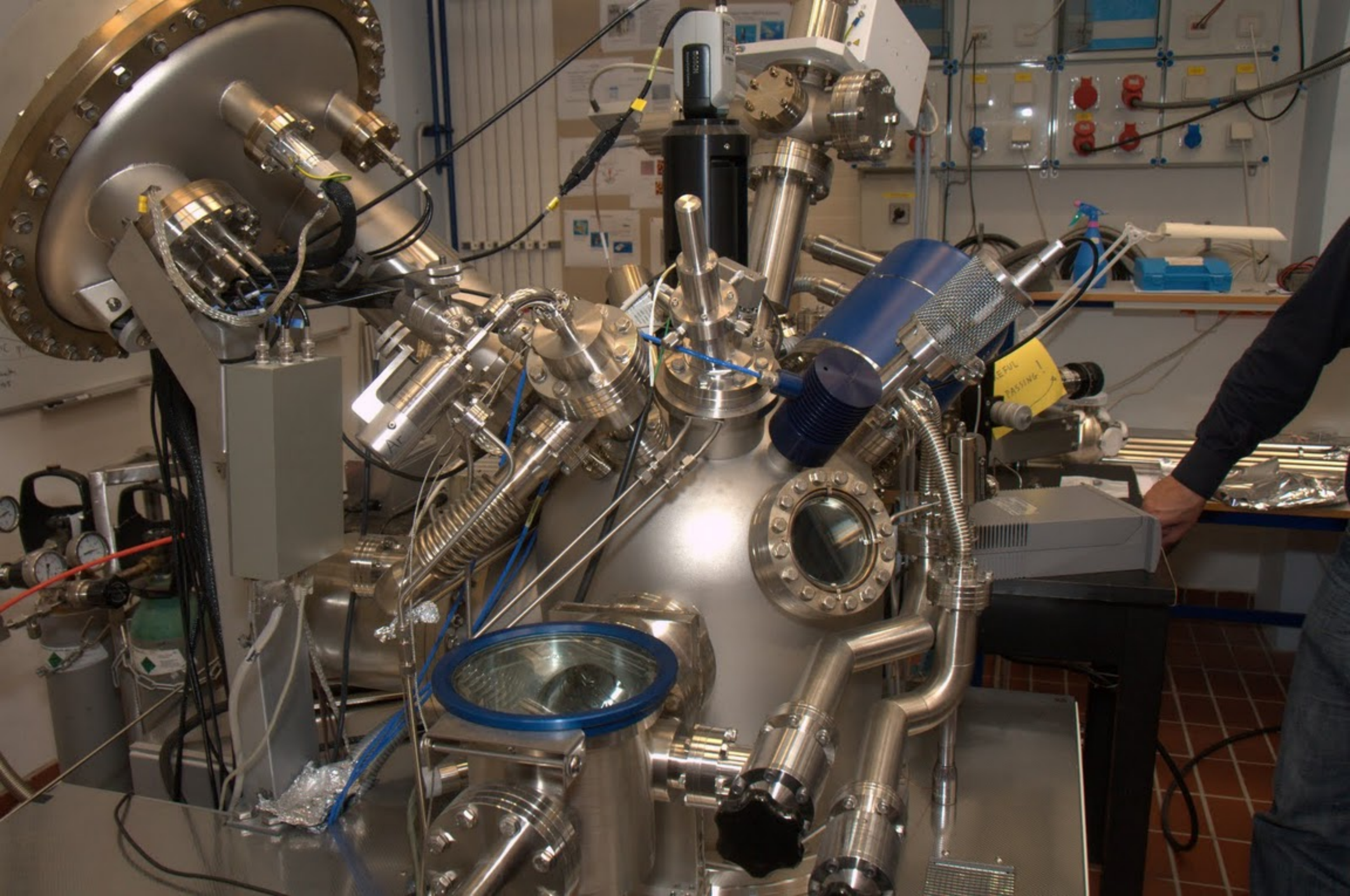


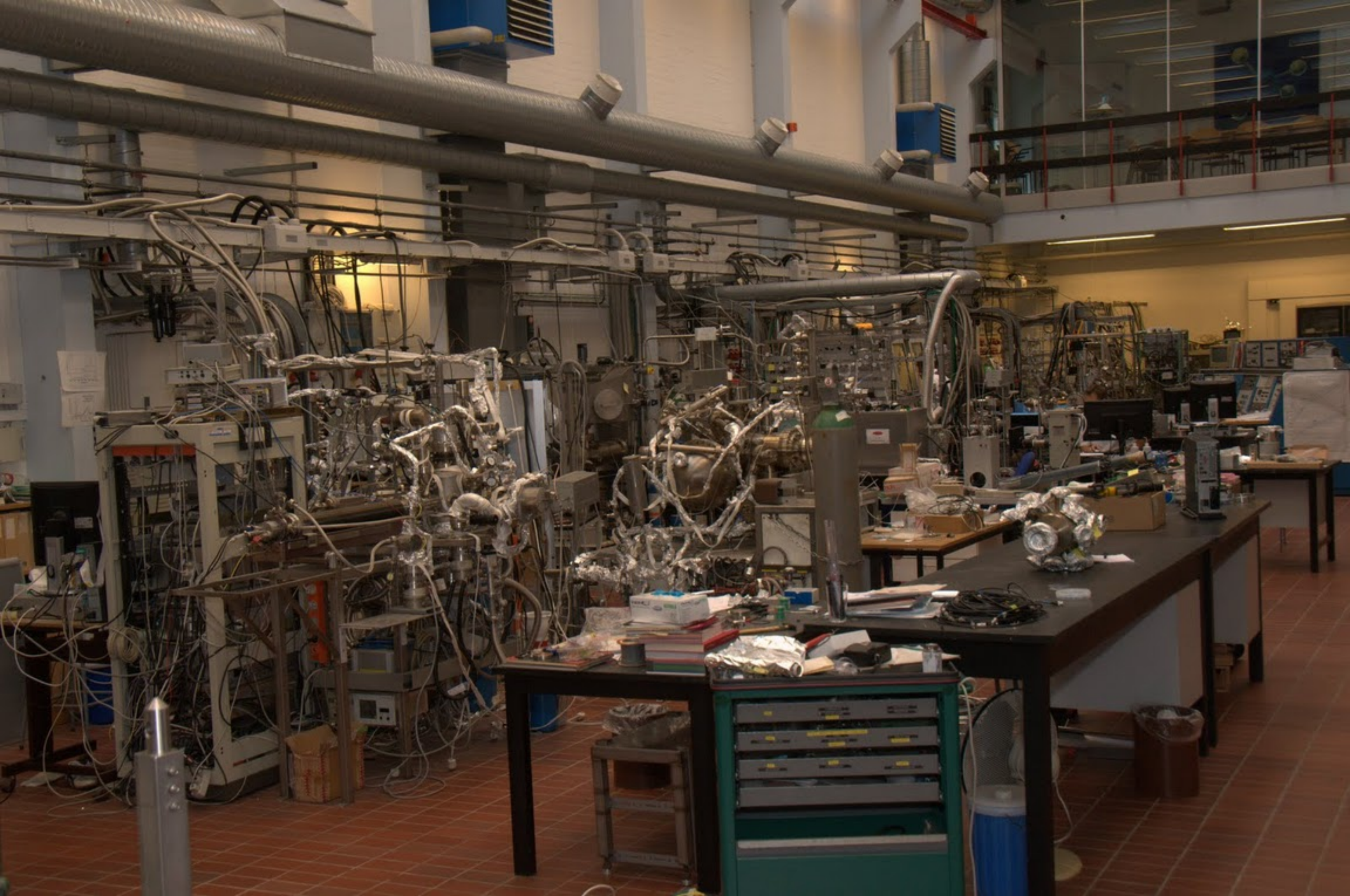


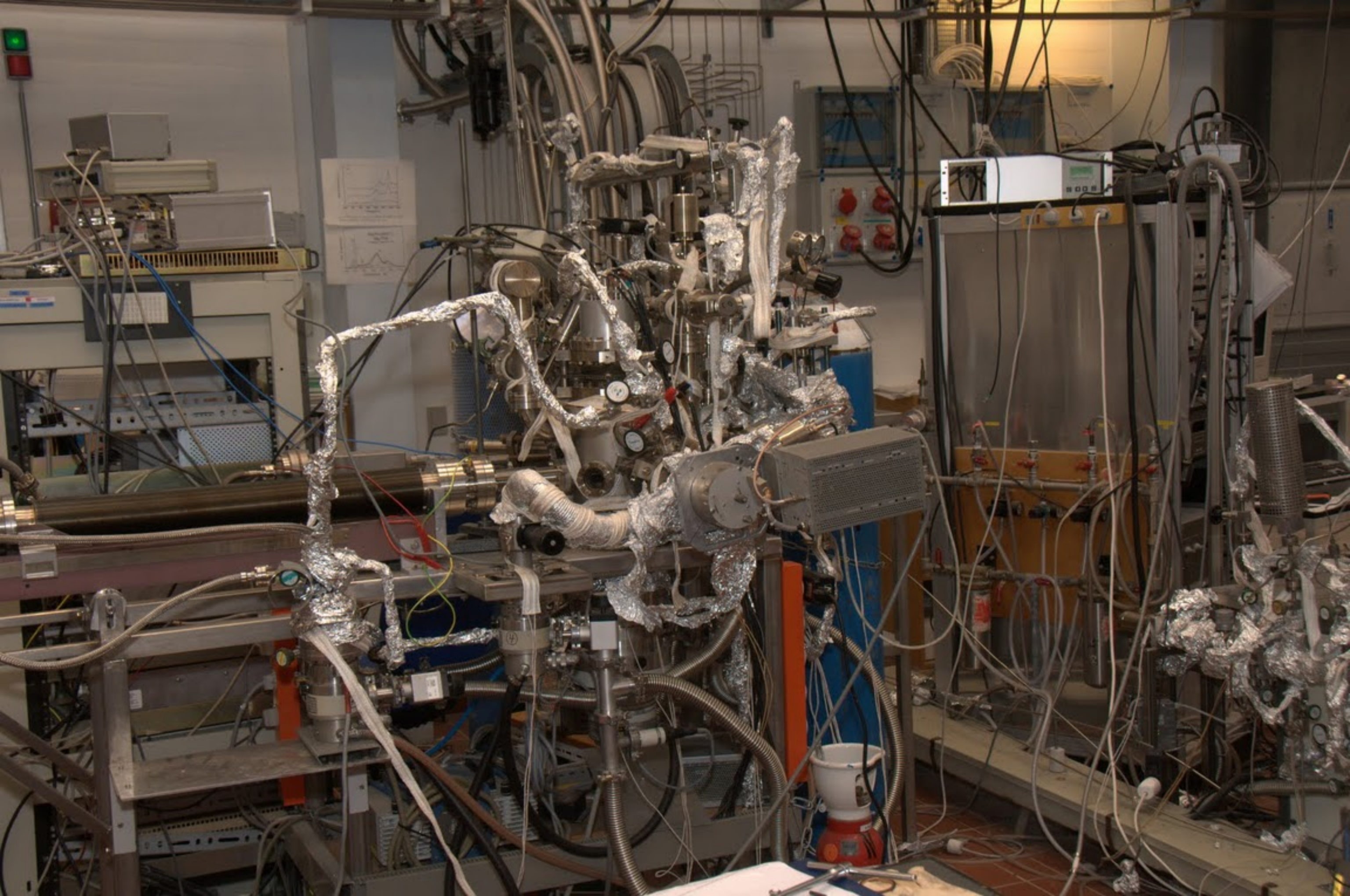












Sub-nanometre Pt films on top of Pt bimetallic alloys as new oxygen reduction electrocatalysts

Tobias P. Johansson, Ifan E. L. Stephens, Alexander S. Bondarenko[†], Ib Chorkendorff



Center for Individual Nanoparticle Functionality

Center for Individual Nanoparticle Functionality

Heine A. Hansen*, Jan Rossmeisl

Center for Atomic-Scale Materials Design

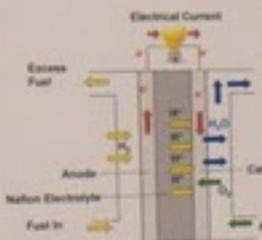


Center for Atomic-scale Materials Design

Department of Physics, Technical University of Denmark (DTU)

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Introduction



The development of low temperature polymer electrolyte membrane fuel cells (PEMFCs) is severely hampered by the fact that the oxygen reduction reaction (ORR) is slow, even using platinum as a catalyst. Recently a new set of platinum compounds have been identified. These include bulk polycrystalline electrodes of Pt_3Ni and Pt_3Co , which were experimentally shown to be 1.5-2 and 6-12 times more active than pure Pt, respectively, in the range 0.9-0.85 V [1].

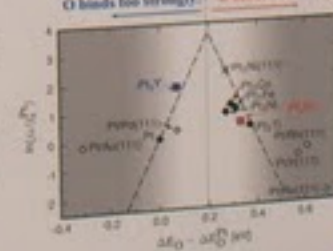
Trends in activity for oxygen reduction

When comparing different closely packed metal surfaces, the stability of each of the ORR intermediates scales linearly with the oxygen binding energy, ΔE_{O_2} . It turns out that the optimal ORR catalyst should have a ΔE_{O_2} which is ~0.2 eV weaker than Pt. This gives rise to the volcano curve shown below.

All structures with a Pt overlayer



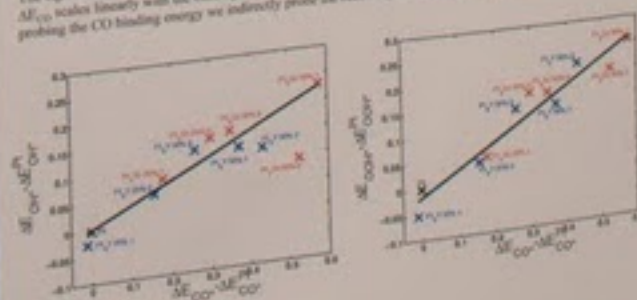
O binds too strongly: O binds too weakly:



Measured kinetic current density at $U = 0.9$ V, as reported in the literature for a range of alloy electrocatalysts with Pt "skins" plotted as a function of the calculated oxygen adsorption energy, ΔE_{O_2} . Experimental data from: * (bulk $Pt_3Ni(111)$ alloys annealed in ultra-high vacuum) * (polycrystalline alloys annealed in ultra-high vacuum) * (Pt monolayers supported on single crystals). All data are shown relative to Pt. The dashed lines are theoretical predictions from references [2,3].

Theoretical calculations

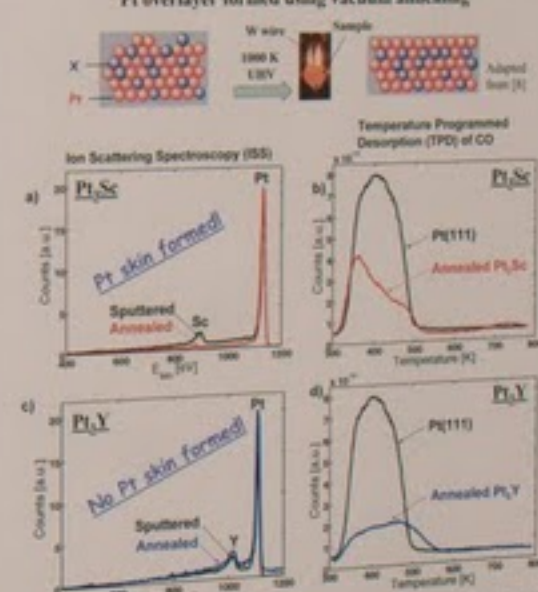
Scaling relations between CO and ORR/ORR intermediates under investigation, the CO-binding energy, ΔE_{CO} , scales linearly with the binding energies of the ORR intermediates, ΔE_{O_2} and ΔE_{OH} . Consequently, by probing the CO-binding energy we indirectly probe the reactivity of the surface for the ORR.



Is the Pt skin stable?

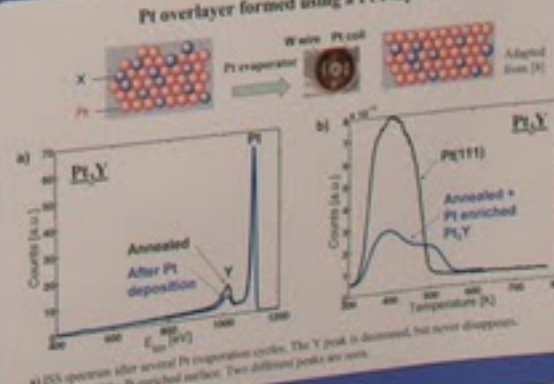
Order: Pt_3Y Pt_3Co Pt_3Ni Pt_3Fe Pt_3Cu Pt_3Ag Pt_3Au Pt_3Pt
 25% 0.45 0.86 0.73 1.16
 Pt skin is unstable → Vacuum annealing will not induce a Pt skin

Pt overlayer formed using vacuum annealing



(a) ISS spectra of a clean Pt sputtered sample before and after annealing to 1000°C. (b) Vacuum annealing of Pt_3Co induces a Pt skin. (c) Vacuum annealing of Pt_3Y does not induce a Pt skin. (d) CO TPD of the annealed sample compared to that of Pt(111). Note that the Pt(111) is 1 mm in diameter whereas the Pt_3Co and Pt_3Y samples are 1 mm in diameter. (e) For Pt_3Co it is seen that the desorption of CO is shifted towards lower temperatures. (f) For Pt_3Y a Pt skin is not formed and the CO TPD consists of two peaks, one close to the peak from Pt(111) and another binding CO slightly stronger.

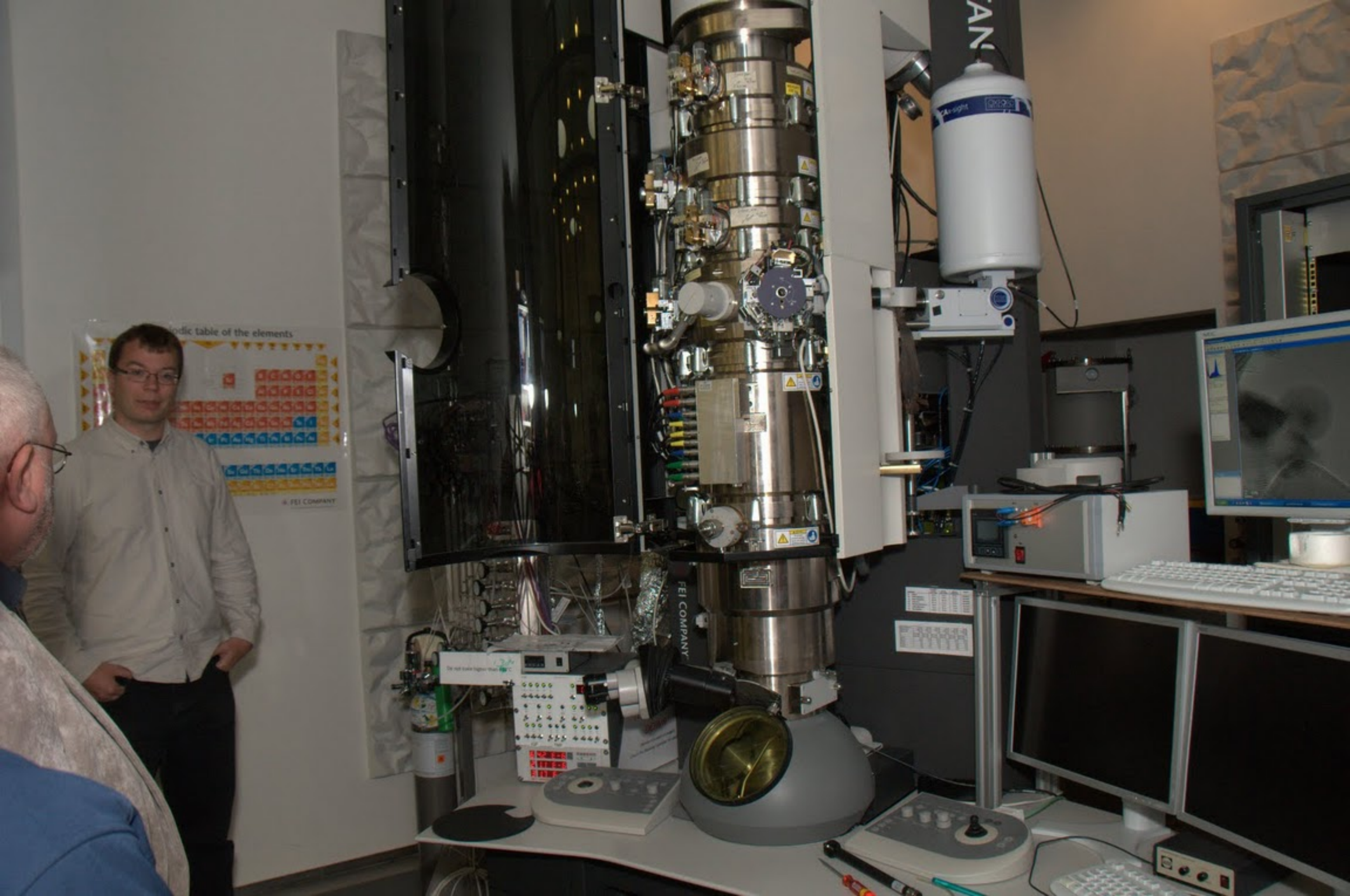
Pt overlayer formed using a Pt evaporator



(a) ISS spectrum after several Pt evaporation cycles. The Y peak is decreased, but never disappears. (b) CO TPD of the Pt enriched surface. Two different peaks are seen.

Conclusions and future work

We find that for the polycrystalline Pt_3Co sample a Pt skin is formed upon annealing in vacuum. The CO desorption temperature is seen to be slightly lower than for Pt(111). This also supports the notion that the different ORR intermediates will be bound weaker, as shown in the volcano plot (above, left). In the case of the polycrystalline Pt_3Y sample, vacuum annealing does not produce a Pt skin on the surface. Pt deposition was tried on Pt_3Y , although the Pt signal in ISS increased, a full Pt skin was not formed. In the future other Pt bimetallic alloys will be characterized and tested.





Histogram



Image Status

Image 8
Type: Integer 4 Signed
Size: 2048 x 2048

Target

☐ Page
☒ Image

Image Info

Voltage: 300.0kV
Magnification: 620.0k

B: MB160-5h_620000X_12



Results

welcome to DigitalMicrograph

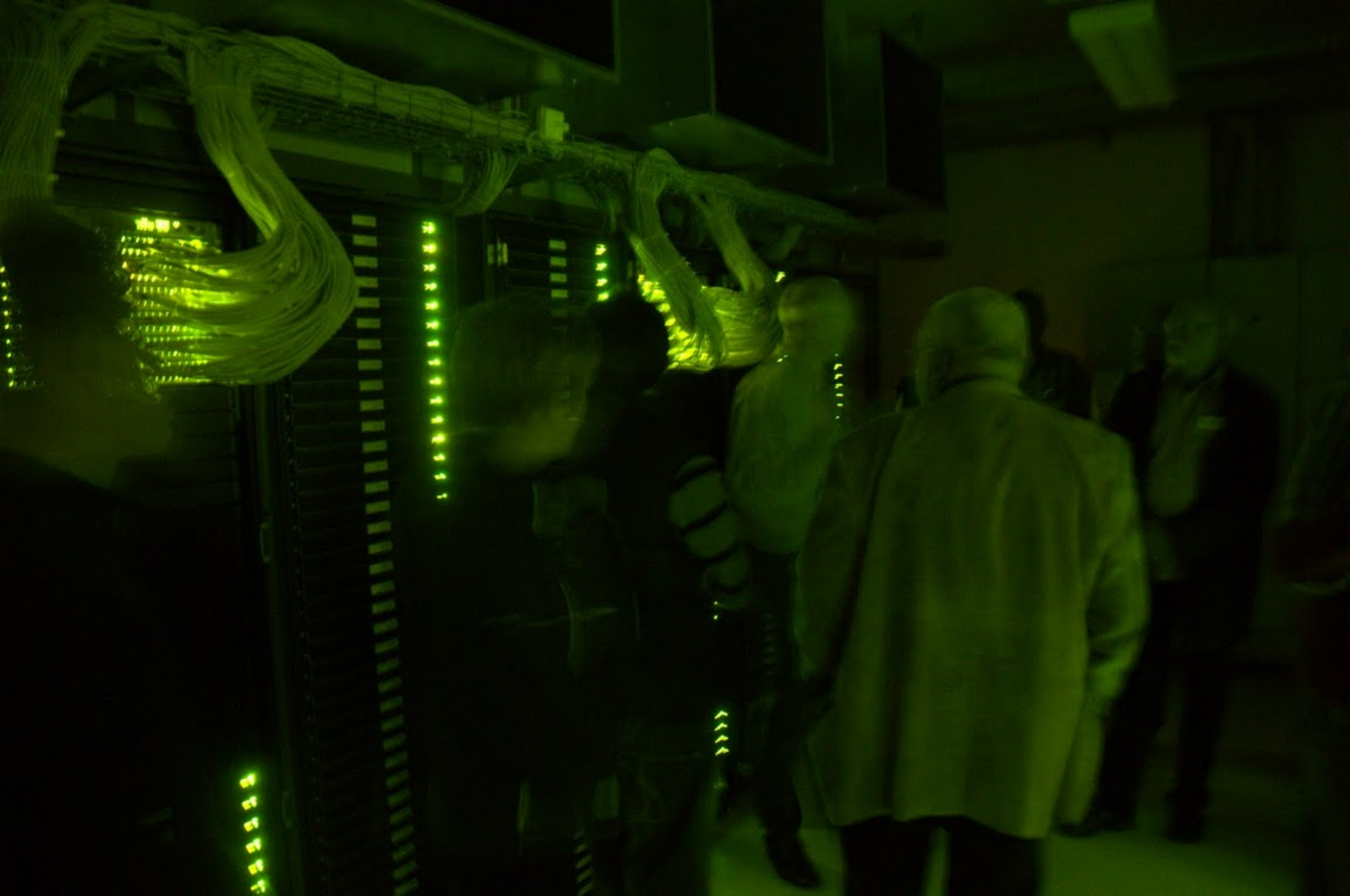


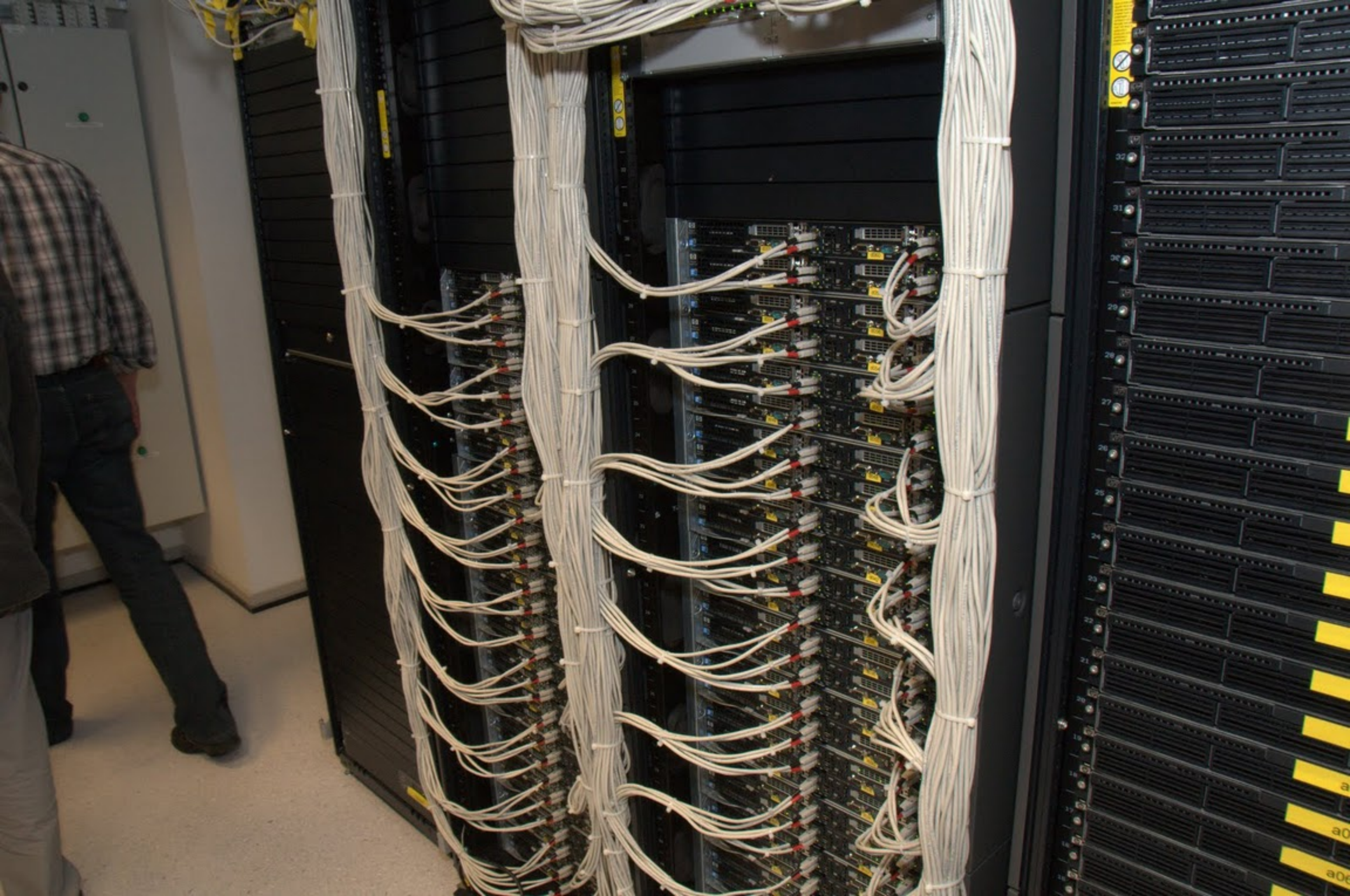
















STOP

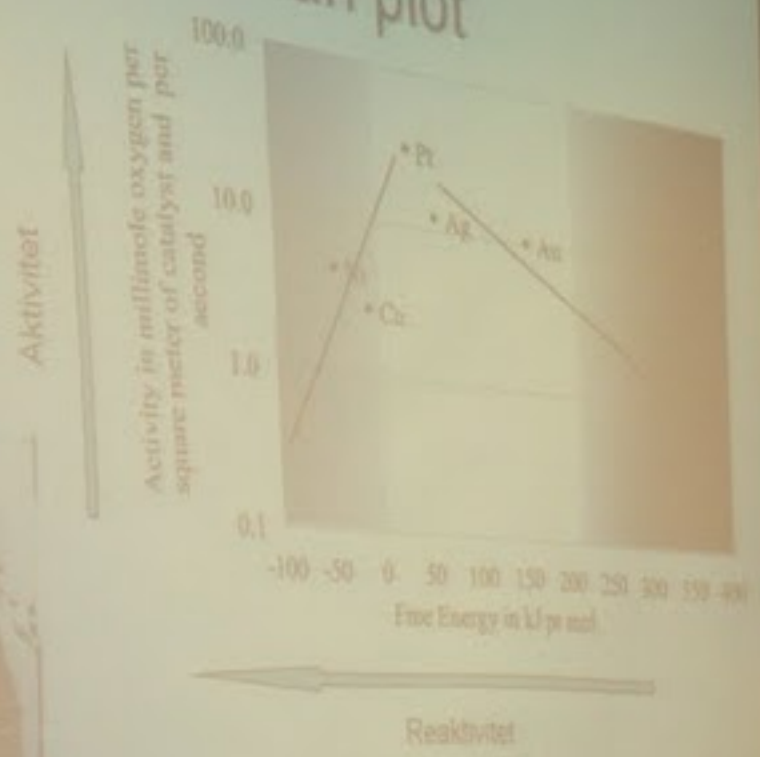
Sabatier princippet forklaret via H_2O_2 dekomponering

September 2011

Ved Anders B. Laursen og
Christian N. Conradsen



Vulkan plot



Man in black t-shirt and khaki pants standing in the foreground, looking at the projection screen.

Three people (two men and one woman) standing in the background, looking at the projection screen. One man is wearing a red shirt, another a green plaid shirt, and a woman in a black top.

