Public Awareness of Research Infrastructure (PARI) III

Conference 8 - 10 April 2019 @STFC ISIS, UK

ERF-AISBL
Association of European-level Research Infrastructure Facilities

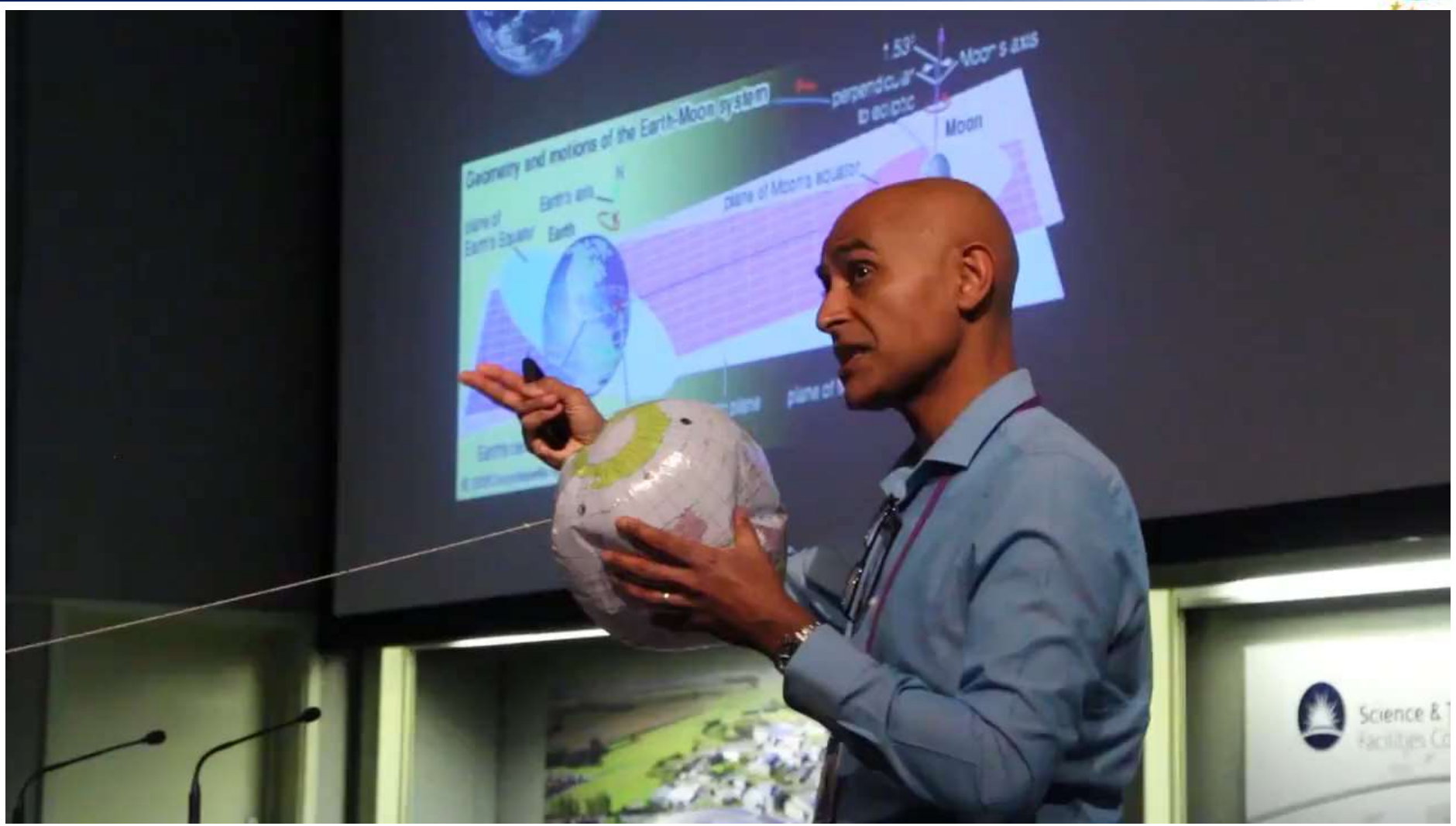
FRM II
Forschungs-Neutronenquelle Heinz Maier-Leibnitz

MLZ
Heinz Maier-Leibnitz Zentrum

Themes:

- Building and maintaining public trust
- Combatting fake news
- Measuring success
- Communicating communications
- Finding the next science superstar / mobilising staff
- Unconventional Outreach: STEM on the Road
- Unconventional Outreach: STEM and Art
- Communicating distributed infrastructures
- Equality and diversity communications

PARI III Workshop - 2019



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ESOF 2018
EUROSCIENCE OPEN FORUM
TOULOUSE

Toulouse hosts **ESOF** and becomes European City of Science 2018!

The 8th edition of ESOF took place in Toulouse, France, from 9 till 14 July 2018.

Science in the City Festival

7 - 15 July 2018

Parallel to the EuroScience Open Forum, the Science in the City Festival invested the city and its surroundings. As a free event, Science in the City Festival is aimed at people of all ages who are curious about science and innovation. It offered 150 events – free to the public.

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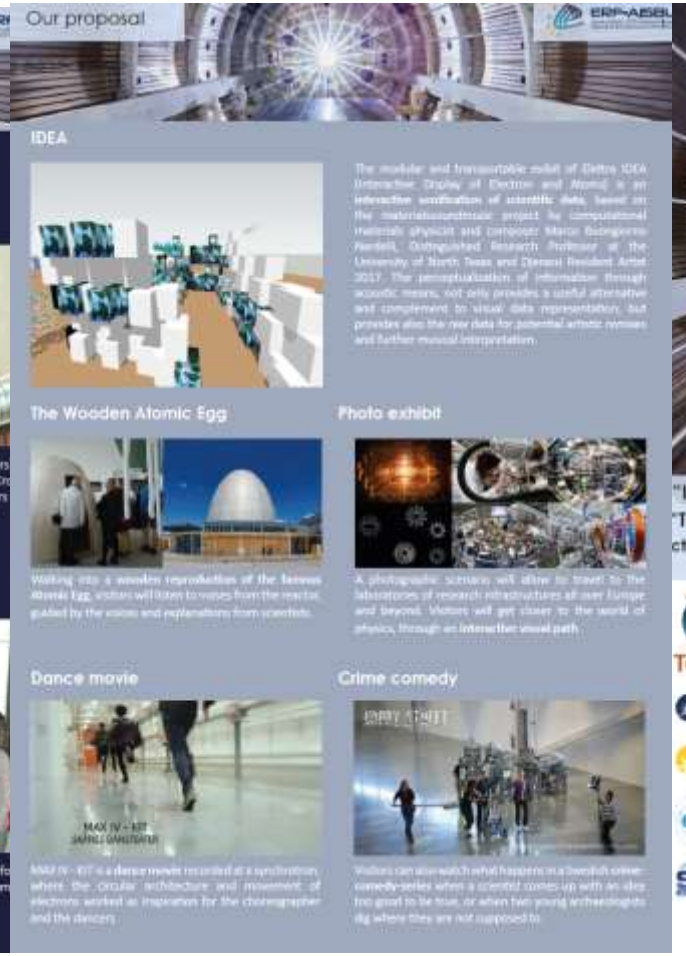
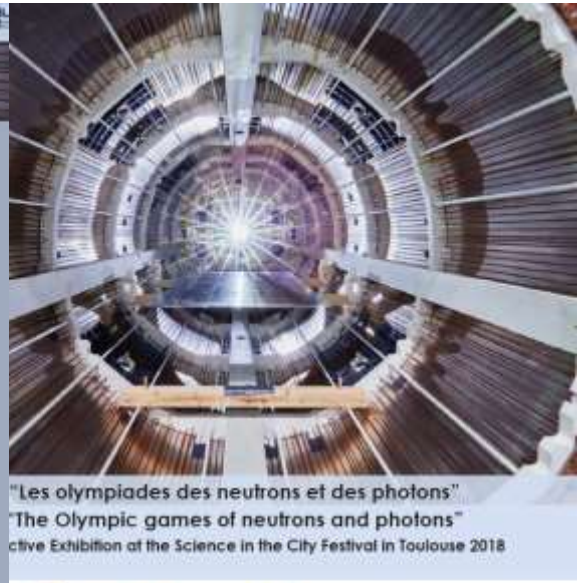
Common proposal of the RICE working group in September 2017





ESOF TOULOUSE 2018
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Science & Technology Facilities Council
MAX IV
EUROfusion
diamond
HZB Helmholtz Zentrum Berlin
ESS
SINE 2020
CERIC
SKA
SOLEIL

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- The planning

	Organization	Country
	European Spallation Source	Sweden, Denmark
	Diamond Light Source	United Kingdom
	Isis Neutron Source	United Kingdom
	Square Kilometre Array Telescope	United Kingdom
	MAX IV Laboratory	Sweden
	Helmholtz-Zentrum Berlin	Germany
	CERIC-ERIC	Austria, Croatia, Czech Republic, Hungary, Italy, Poland, Romania, Slovenia
	EUROfusion: European Consortium for the Development of Fusion Energy	Europe
	Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II)	Germany
	Elettra Sincrotrone Trieste	Italy
	Synchrotron SOLEIL	France
	SINE2020	Czech Republic, Denmark, France, Germany, Hungary, Italy, Portugal, Spain, Sweden, Switzerland, The Netherlands, UK

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• The planning

From 250 m^2 confirmed beginning of May 2018 down to 50 m^2 end of May 2018

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- The action

Implementation of “The Olympic games of neutrons and photons”:

- Scientific topics to chose:
  1. ENERGY
  2. ASTRONOMY
  3. CULTURAL HERITAGE
  4. ENVIRONMENT
  5. HEALTH
  6. MATERIAL ENGINEERING
- Provided equipment for visitors:
  - Postcard
  - Lanyard with gold medal
  - Certification “Olympic scientist”
  - Photo booth

- Game structure:
  - Visitors chose a scientific topic (problem to solve).
  - Visitors will be guided to the different stations.
  - Roll-ups with explanations of the activities will be provided at each station (related to facilities and/or to scientific topics of the “path” (more than one path can pass through an activity).
  - At each station, a stamp will be collected on the postcard.
  - A set of Success Stories divided under the different scientific topics will welcome the visitor after completion of the path.
  - By showing the fully stamped postcard, the visitor will receive his “gold medal” and "scientist certification".
  - As a memory, take a picture at our Photo booth.

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Key facts:

- Participation RICE WG: 10 – 15 July 2018
- Participants ONSITE: 8
- Event space: 50 m^2
- Common activities and individual activities

Designs:


UNIVERSITY OF ESOF 2018
@ Science in the city festival

DIPLOMA
OF HEALTH SCIENCE

This is to certify that

has fulfilled the requirements for

DIPLOMA OF HEALTH SCIENCE

at „The Olympiad of neutrons and photons"
in Toulouse, France

Dated the

day of July 2018

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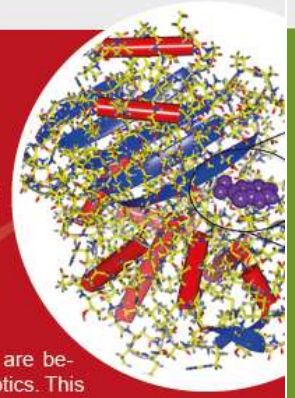
Success stories in English and French

HEALTH

How can we win the fight against bacterial infections?

S. J. Tomanicek et al.,
J. Biol. Chem., 288, 4715 (2013)



More and more bacteria are becoming resistant to antibiotics. This makes it hard to treat diseases and increases dramatically the mortality rate.

To develop new antibiotics (green) we need a better understanding of the enzyme (grey) inside the bacteria, which are making the antibiotic useless.

Scientists combined two research methods: High-resolution x-ray diffraction (photons) and neutron diffraction to see directly the atoms inside the enzyme. This understanding allows us to design new effective drugs to win the fight against bacterial infections.

ENVIRONMENT

How can we hear noises through the air?

M. Laaß and B. Schillinger,
Phys. Procedia 69, 628 (2015)

360 million years ago, the first vertebrates that developed from amphibians were not able to hear airborne sound, as this had not been necessary for life in water.

Nevertheless, these animals were not completely deaf. It is believed that they could perceive ground vibrations especially via the jaw resting on the bottom, as do some snakes and crocodiles to this day.

In order to hear the much weaker airborne sound, however, a drum, a middle ear with hammer, anvil and stirrup for amplification and a specialized inner ear are necessary.

Using neutron tomography on skulls from vertebrates, geoscientists have found that airborne sound listening began 30 million years earlier than previously thought.

MATERIAL ENGINEERING

How can we save on fuel?

U. Wasmuth et al.,
CIRP Annals - Manufacturing Technology 57, 579 (2008)

Internal stresses in metals lead to deformations andeven to cracks.

Workpieces made of two different metals, such as cylinder liners in the engine block of cars, are affected by such residual stresses. The light metal casting of the engine block, which is cast around the bushing, contracts more during cooling than the liner itself. It comes to tensions.

Neutrons that hit atoms of aluminum and steel measured the change in atomic distances. The scientist showed that the computer programs that simulate the stresses of the composite casting during cooling calculated the tensions three times higher than they actually were.

The car industry will now be able to build lighter engines and thus reduce fuel consumption.

CULTURAL HERITAGE

Did Napoleon die of arsenic poisoning?

X. Lin et al.,
Anal. Bioanal. Chem. 379, 218 (2004)

The debate on the cause of Napoleon's death on 5th May 1821, was fueled, when a high content of arsenic was found in his hair in 1961. Hair cut from Napoleon seven years before his death, in his exile on Elba, and two hairs cut immediately after his death on the island Helena, were irradiated with neutrons. Using the so-called neutron activation analysis the scientists could define the exact amount of arsenic in the hairs of Napoleon.

The results show that the arsenic in his hair had even declined within those seven years between the two haircuts and was not enough to be poisonous.

It is rather suggested, that the arsenic stems from outer contamination as it could be found on wall paper or in drinking water.

On the contrary, the scientists found a very high concentration of antimony (Sb) in the hair cut immediately after his death favoring another poisoning theory.

THE OLYMPIC GAMES OF

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Ca. 4600 visitors in 5 days

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Visit of the French science minister Frédérique Vidal

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- The aftermath

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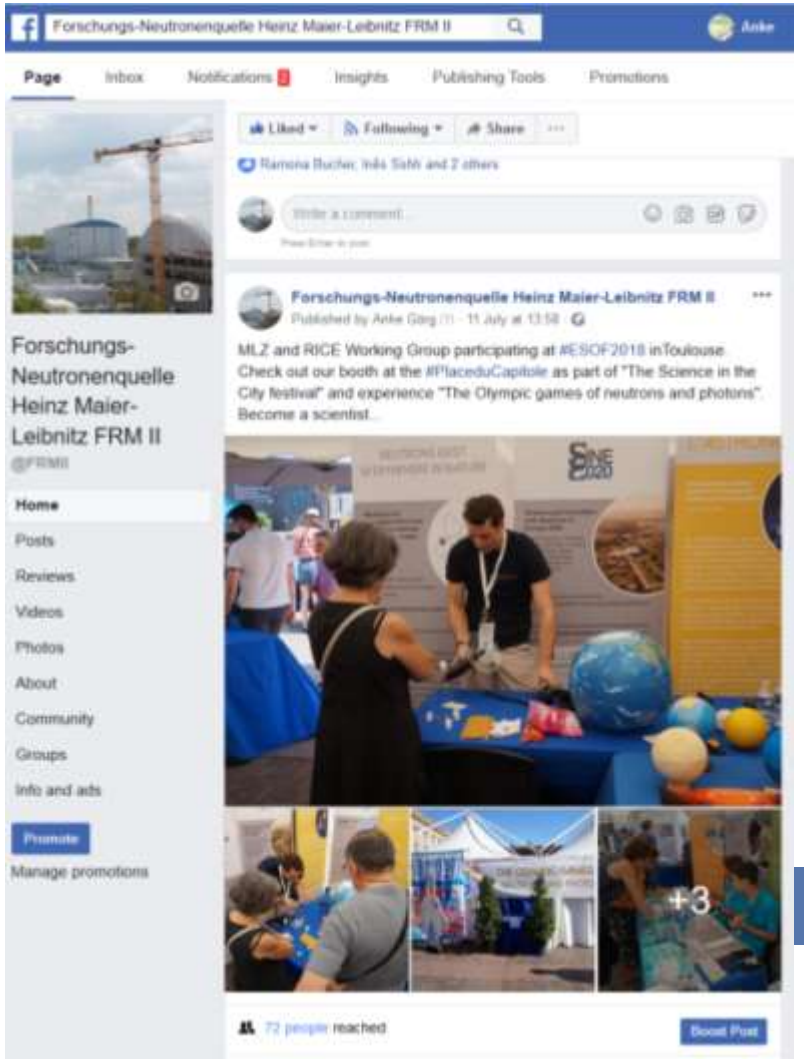
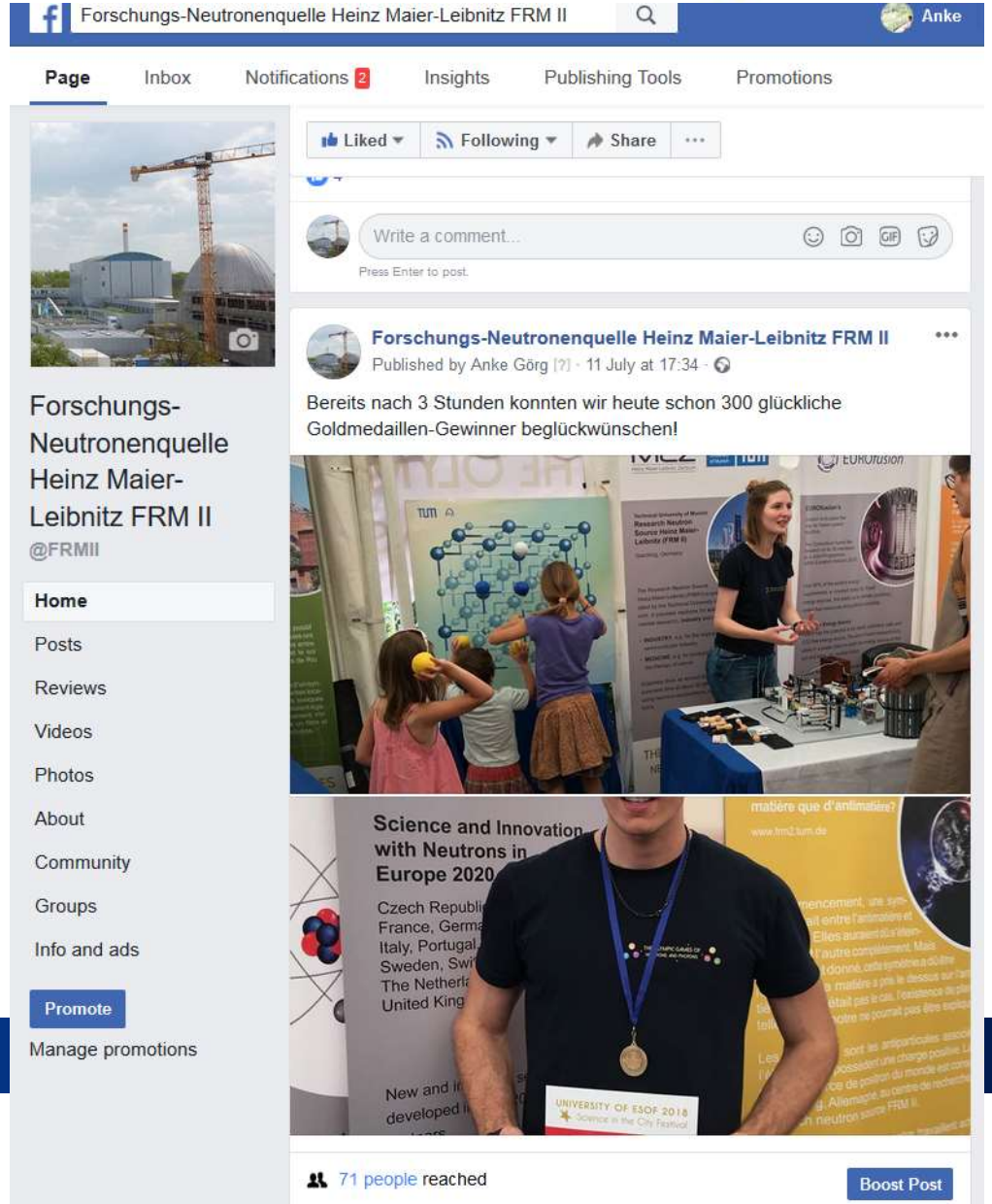
- The aftermath





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Thanks for your attention!

by Anke Görg, Andrea Voit @ MLZ