



MATHMET

# Artificial Intelligence

## Activities@MATHEMT\_EMN



**Metrology for Digital Transformation**  
Online - 23.09.2021



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# MATHMET

***MATHMET EMN is the  
European Metrology  
Network on  
Mathematics and  
Statistics***

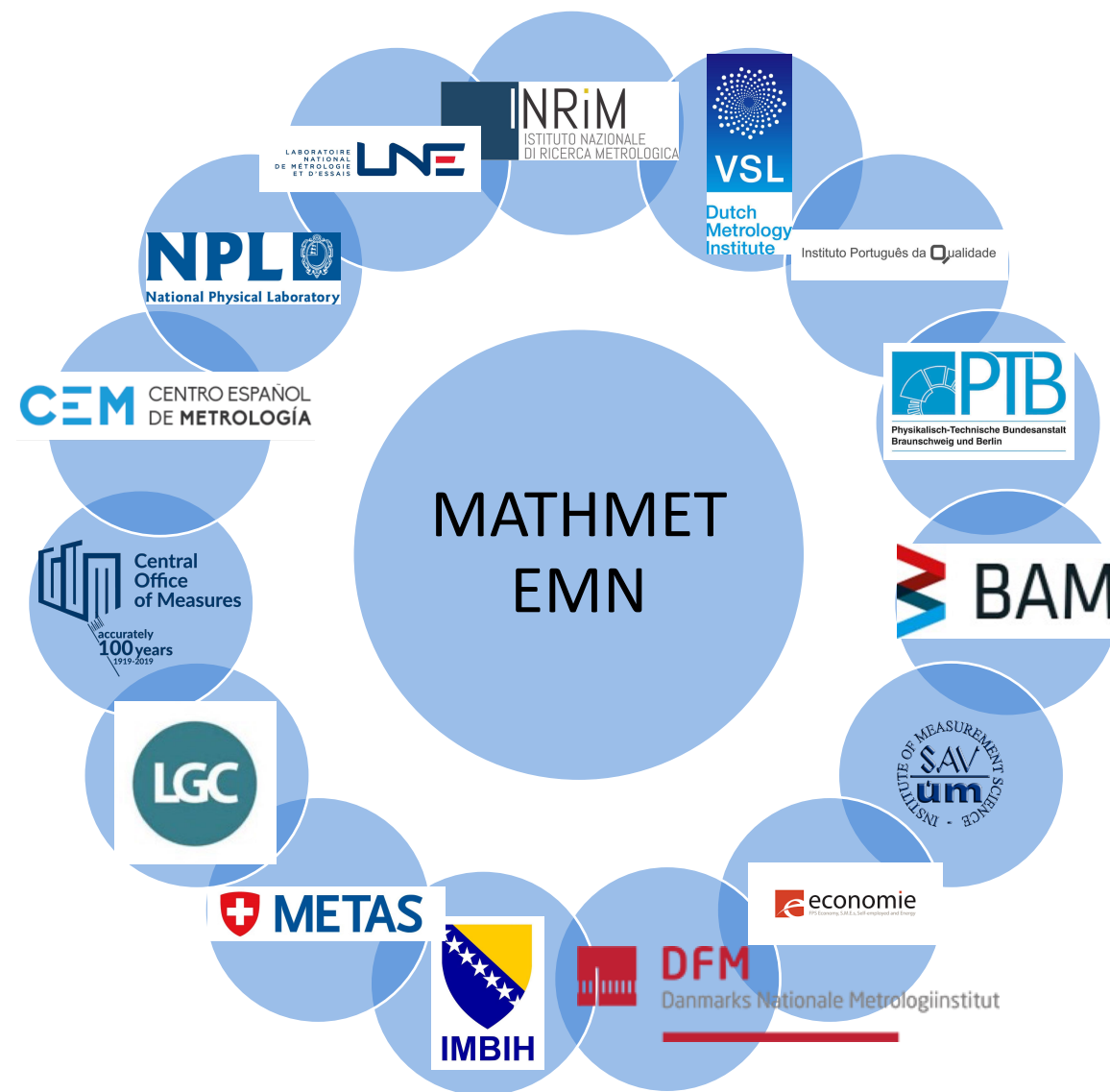




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# Who we are

- EMN was established in June 2019
- Today it comprises 15 NMIs/DIs and partner institutes
- Supported by EMPIR project 18NET05





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# Our Objectives

*We **build links between** National Metrology Institutes, academia and industry to **foster Mathematics and Statistics for metrology.***

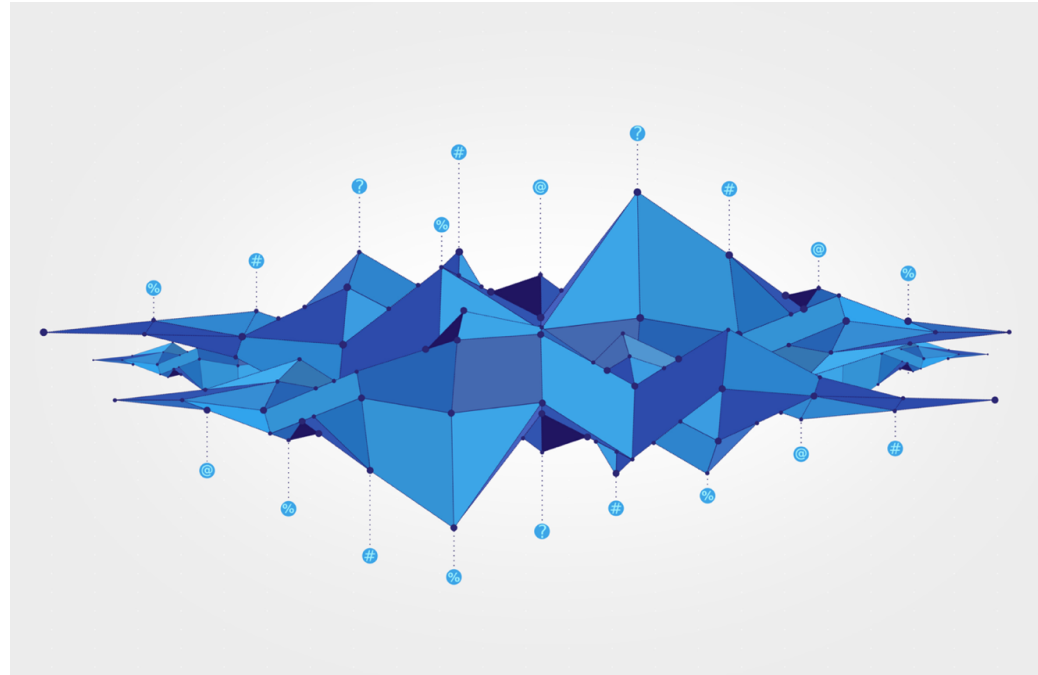
- Collaborative research
- Point of reference
- Creating a sustainable infrastructure





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# MATHMET\_RESEARCH



Applications

AI

Uncertainty

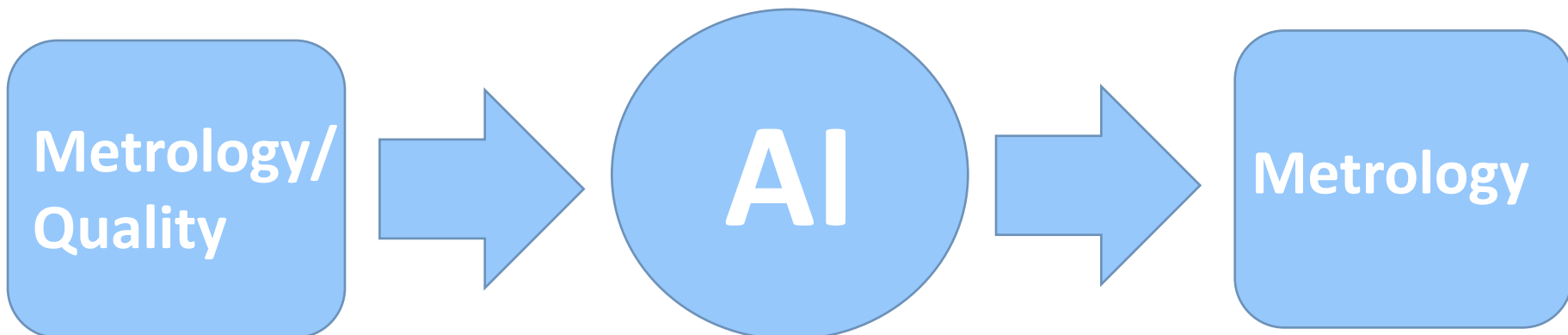
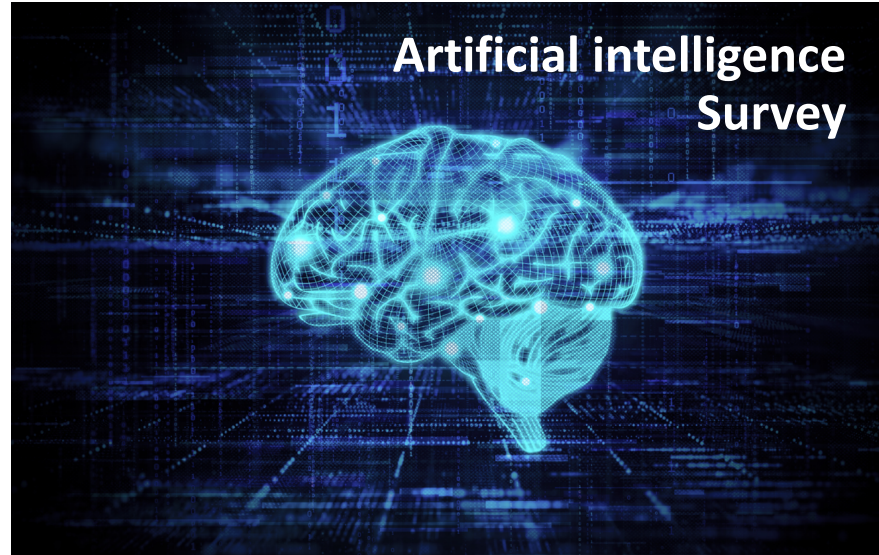
Modelling



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# AI@MATHMET

- *Survey among MATHMET members to access opinions and capacities of NMIs/DIs*
- *Stakeholder interviews*
- *White paper on AI – A European Approach to excellence and trust (by EC)*

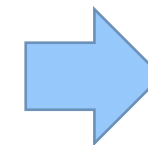




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# Research Priorities

Metrology  
/ Quality



AI

## Trustworthiness and Secure AI

### Reliability

- Robustness
- Repeatability
- Validation
- Quality of training data
- **Standardisation**

(talk by Valerie)

### Explainability

- Interpretability of results
- Transparency
- Comprehensibility/  
understanding AI
- Confidence

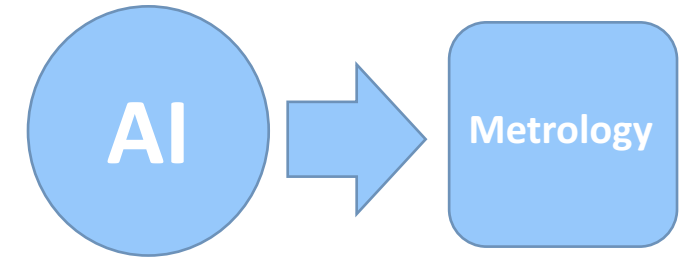
### Traceability

- Uncertainty evaluation
- Examples for metrology



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# Research Priorities



## Next generation Metrology

### Improved data analysis

- Big data
- Automated data analysis
- improved inline metrology

### New metrological applications

- Imaging
- Sensor networks
- Improved calibrations
- Autonomous driving

### Virtual metrology

- Digital twins
- AI + modelling
- Predictive maintenance of experiments
- Forecasting

(talk by Jörg)



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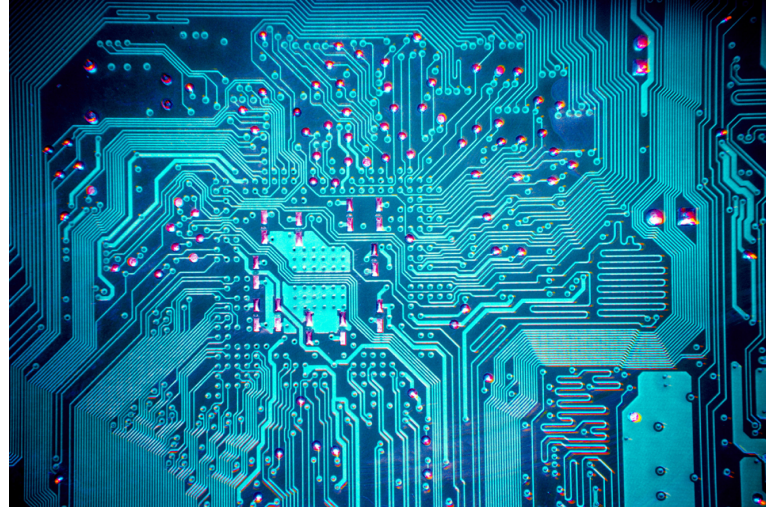
# Why the effort?

## Health



- **EMPIR: MedalCare** (talk by Markus)
- Medical imaging
- Electromagnetic dosimetry
- ECG/EEG feature analysis
- ...

## Industry



- EMPIR: ATMOC
- EMPIR: Met4FoF
- Scatterometry
- Optical form measurements
- Process optimization
- ...

## Environment



- Sensor networks
- Condition monitoring



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# You want to know more?

*Visit our Website!*



<https://www.euramet.org/european-metrology-networks/mathmet/>

# You have an interest in AI and Metrology ?

*Join our Stakeholder advisory committee!*



**Contact:**  
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