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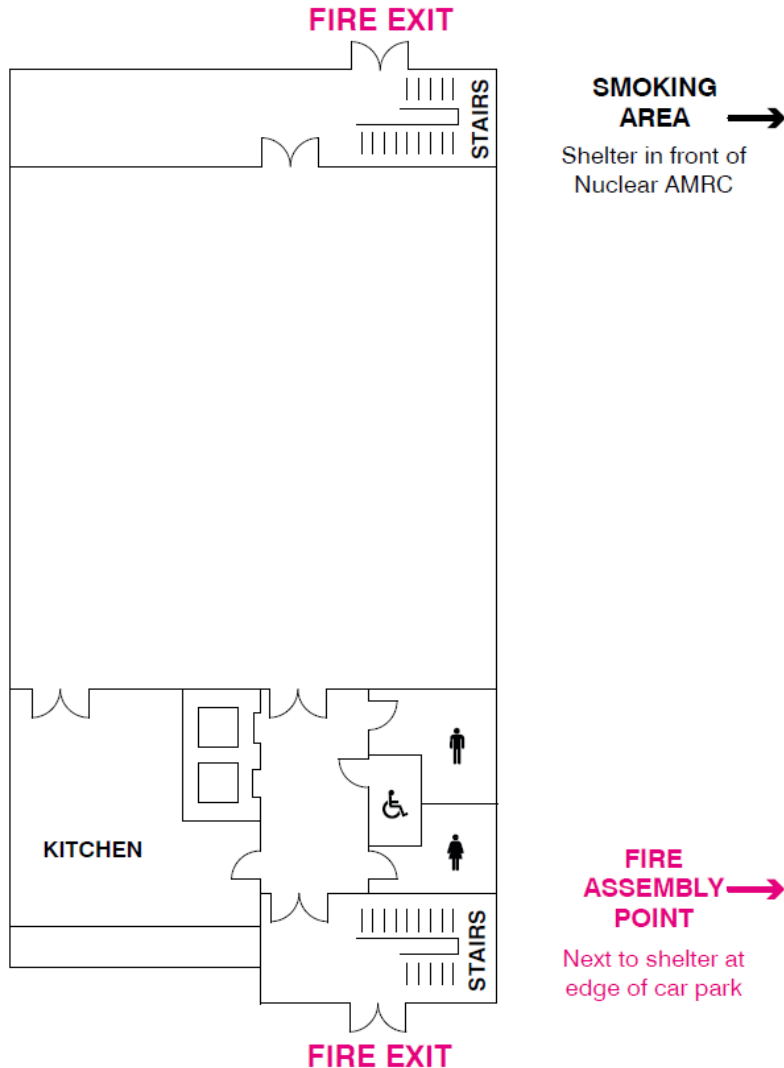
Integrated metrology for precision manufacturing

Richard Leach



Floor plan

Second floor



Welcome to the AMRC Knowledge Transfer Centre

This is an introduction to the safety procedures for your visit. If you have any questions please ask a member of staff or ring **0114 222 9940**.

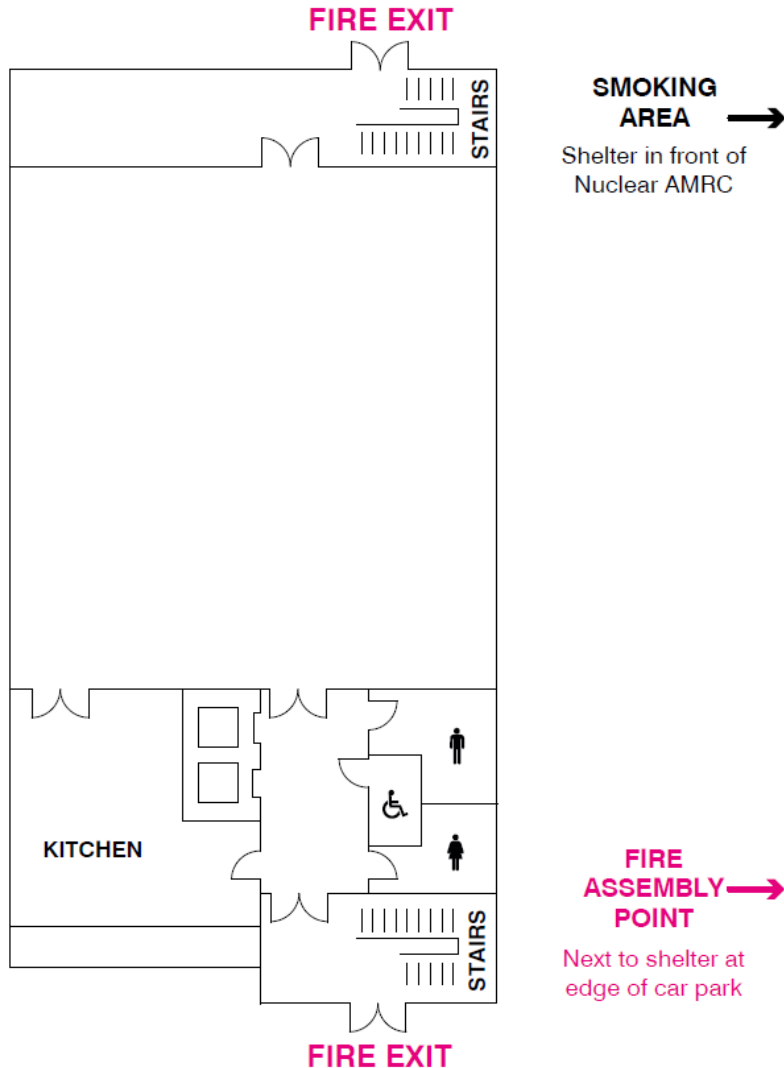
Security

- Visitors to the Knowledge Transfer Centre must be signed into site and you must wear your lanyard whilst on site. Please return your lanyard when you leave.
- Photography is not allowed anywhere within AMRC buildings without express permission.



Floor plan

Second floor



Health & Safety

Fire

In the event of a fire alarm:

- Please leave the building immediately by the nearest fire exit. Fire exit locations are shown on the floorplan overleaf. The assembly point is on the far side of the car park in front of the KTC.
- If you discover a fire, raise the alarm by breaking a red fire alarm call point.
- Call the fire service on 0114 222 4444.

Medical emergencies

In the event of a medical problem:

- Please ask a member of staff or call 0114 222 9940 for a first aider.

Smoking

- The University of Sheffield has a no smoking policy.
- Smoking is only allowed in designated areas.
- The smoking area is located on the far side of the car park in front of Nuclear AMRC.



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Met Map project



- Catapult Researcher-in-Residence award from HVMC and EPSRC
- 2 years starting on 1st April 2018
- Final output will be a “Roadmap for Integrated Metrology in UK”, towards the end of 2019





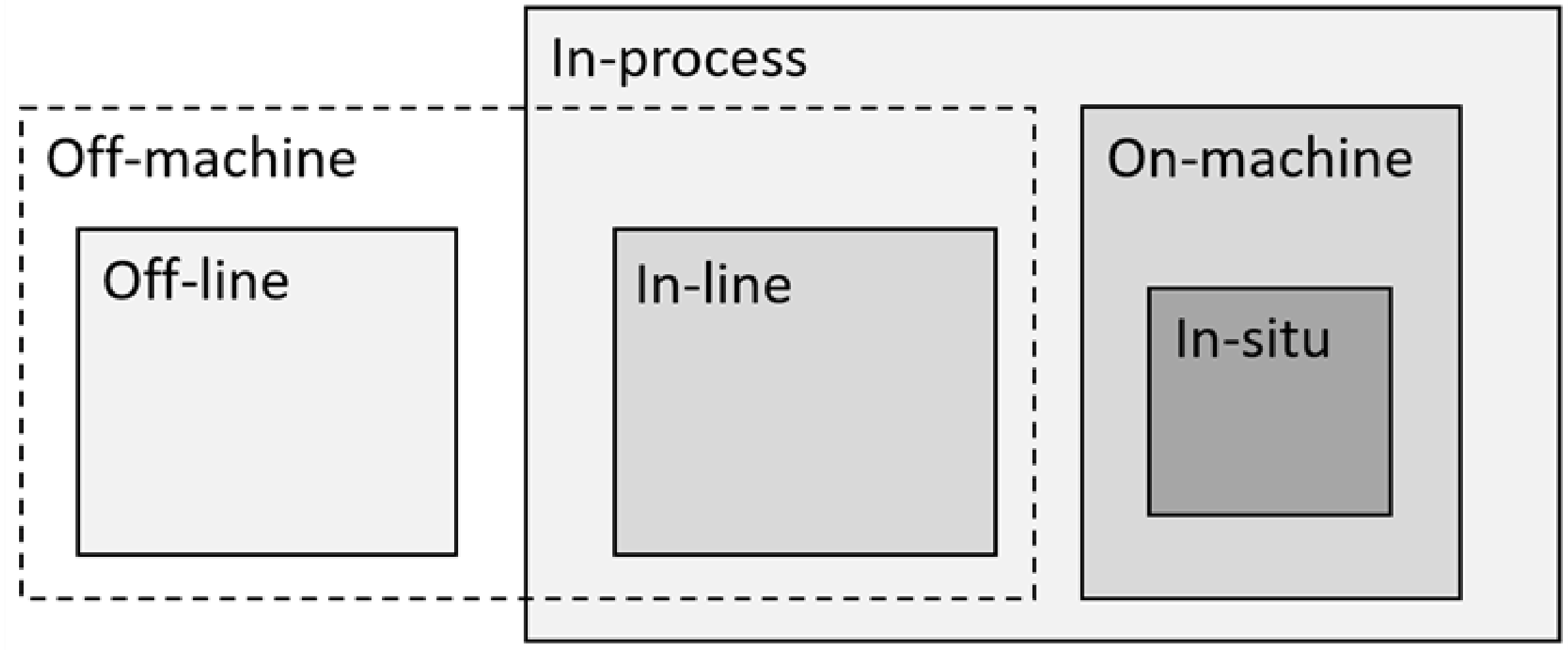
- Review existing literature, roadmaps, reports, strategies
- Continue to be active in HVMC Metrology Forum
- Inventory at each HVMC (survey and visits)
- Survey open: <https://nottingham.onlinesurveys.ac.uk/integrated-metrology>



“Integrated metrology for precision manufacturing” (22-23 January 2019, AMRC)

“Integrated metrology for additive manufacturing” (17-18 July 2019, MTC)







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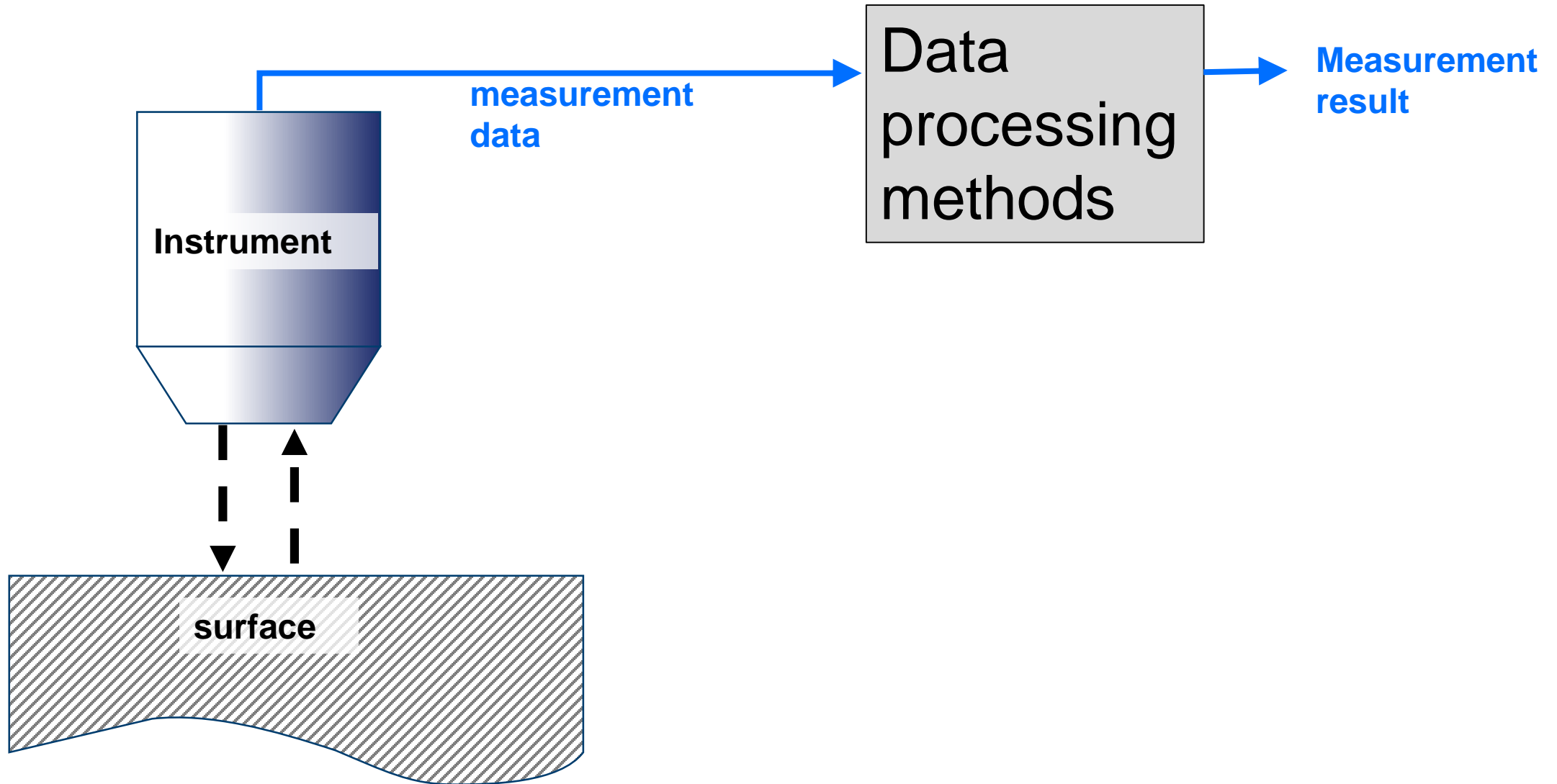
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Information- rich metrology



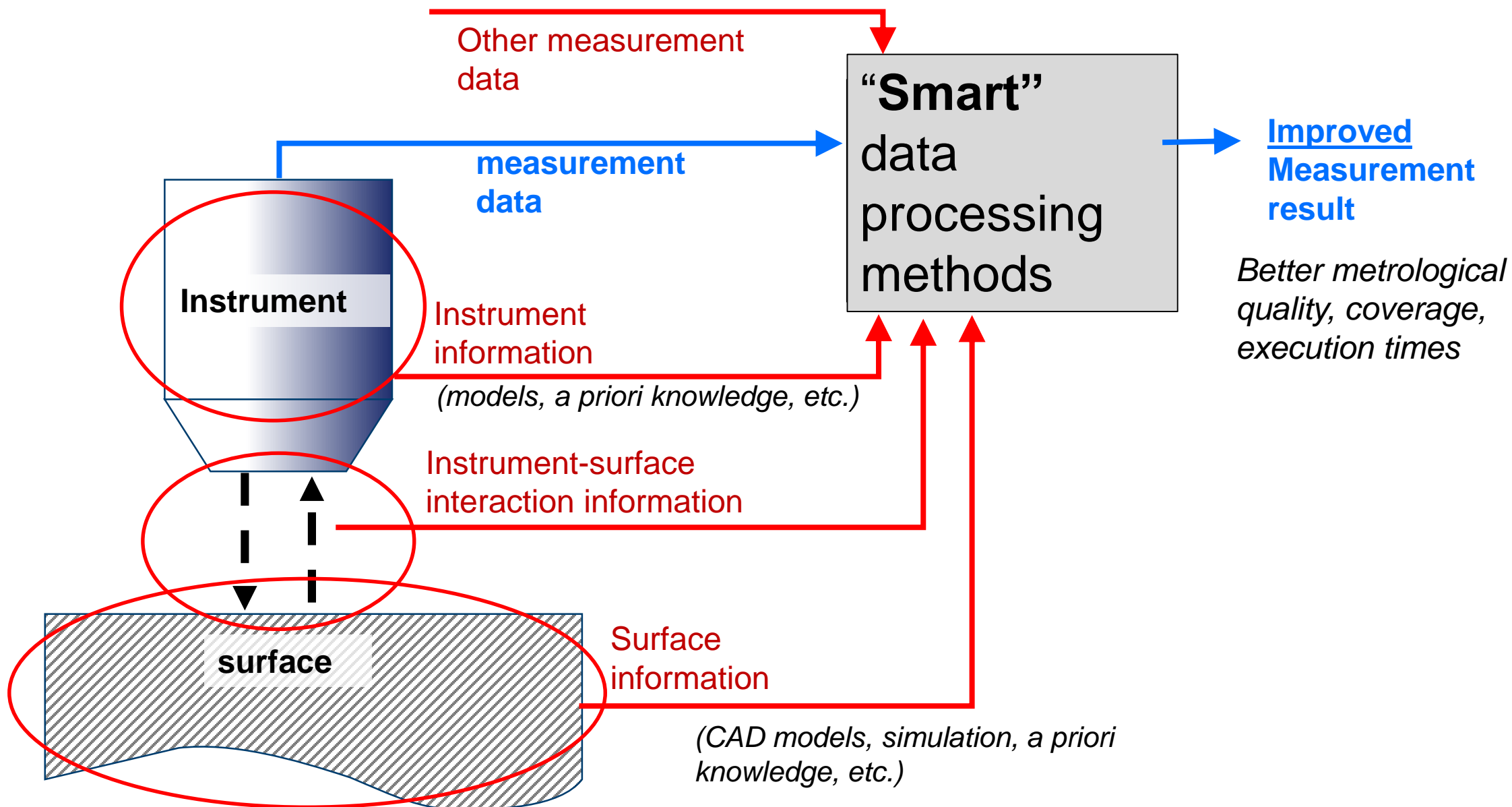
... the use of any type of available, **additional information** to improve a measurement process

Information flow in conventional surface measurement





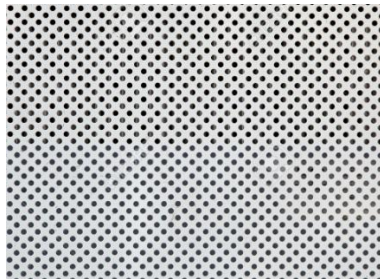
Information-rich metrology



Phase approach to incorporating IRM in-process



Example:



Micro-holes measurements



CCD-based in-line metrology solution



Control system



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Open research questions



1. The need for speed





2. Data overload





3. Control strategies





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Agenda



- 09:00-09:15 Welcome Talk: Richard Leach, Conference Chair
- 09:15-09:45 Keynote 1: Rob Dwyer-Joyce – University of Sheffield
- 09:45-10:15 Coffee & Networking
- 10:15-10:45 Session 1 Sensor development – State-of-the-art review
- 10:45-12:45 Session 1 Sensor development
- 12:45-14:00 Lunch
- 14:00-14:30 Session 2 Data handling – State-of-the-art review
- 14:30-16:00 Session 2 Data handling
- 15:30-16:00 Coffee & networking
- 16:00-17:30 Laboratory tours – Richard James
- 18:30-21:00 Evening Meal



- 09:00-09:30 Keynote 2: Mostafizur Rahman – MTC
- 09:30-10:00 Coffee & networking
- 10:00-10:30 Session 3 Process monitoring – State-of-the-art review
- 10:30-11:50 Session 3 Process monitoring
- 11:50-13:00 Lunch
- 13:00-13:30 Keynote 3: Rab Scott – AMRC
- 13:30-14:00 Session 4 Process control – State-of-the-art review
- 14:00-15:40 Session 4 Process control
- 15:40-16:40 Open forum and discussions – survey session
- 16:40-17:00 Closing remarks

- EPSRC and HVMC for funding
- HVMC Metrology Forum
- Met Map Conference Organising Committee Members
- All speakers
- Andrew Dickins – who did all the real work

PI

 **armstrong
optical**

Mitutoyo

alicona

 **Lambda**