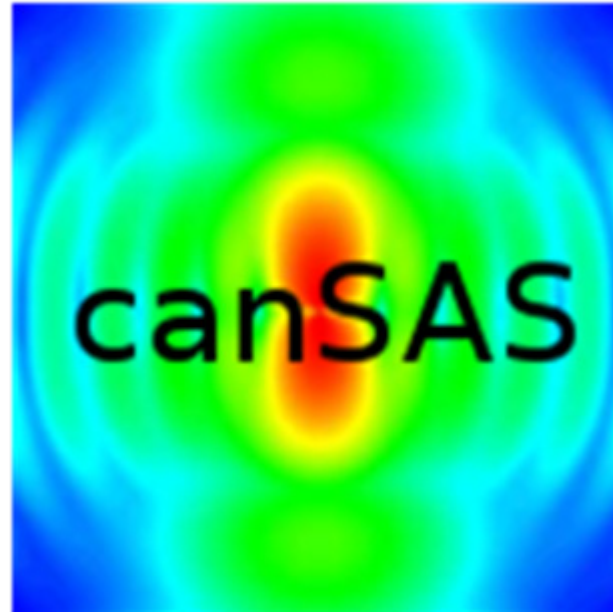




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Standardization





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Agenda

- What is standardisation?
- Summary of what has been done
- Discussion as to what should be done

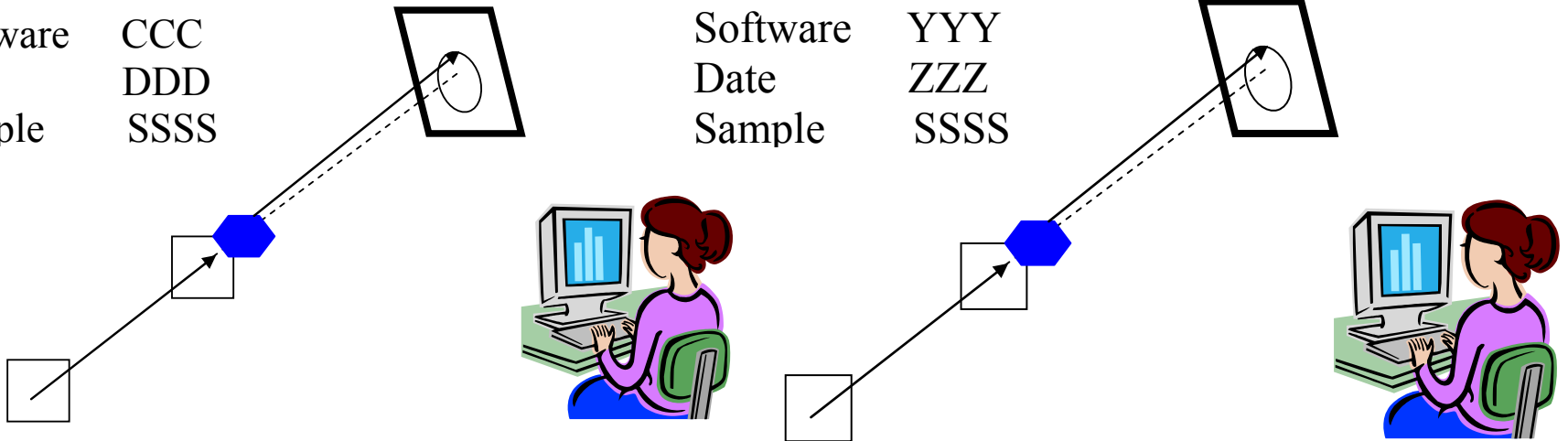
How to join in the activities?



What is standardisation?

Instrument	AAA
User	BBB
Software	CCC
Date	DDD
Sample	SSSS

Instrument	WWW
User	XXX
Software	YYY
Date	ZZZ
Sample	SSSS



Do I get the same result? Has the sample changed?

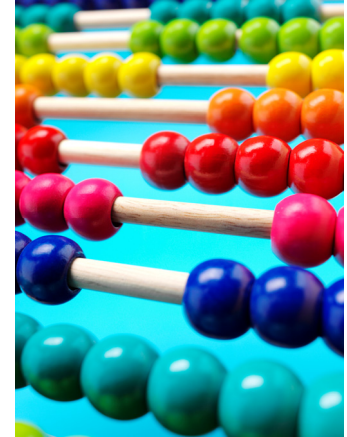
How sure am I? How do we obtain similar results? Do we understand the differences?



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More than Calibration

- Wavelength
- Distance
- Angle
- Intensity
- Resolution
- Uniformity of detector
- etc.



How do I check these quickly?



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Different Questions?



User: Do I understand the data? Are my results publishable?



Instrument scientist: Why are results different? Can the user publish the data?



Facility Manager:

My instruments are the best?

Everyone needs to understand better!



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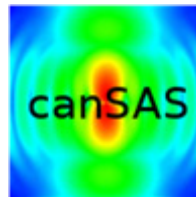
Why Standardisation?

Comparisons:

- Samples
- Instruments
- Procedures
- Techniques
- Software

**Provide understanding of
small-angle scattering!**

**Co-operation and comparison
helps this understanding**





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Recent (ongoing) Projects

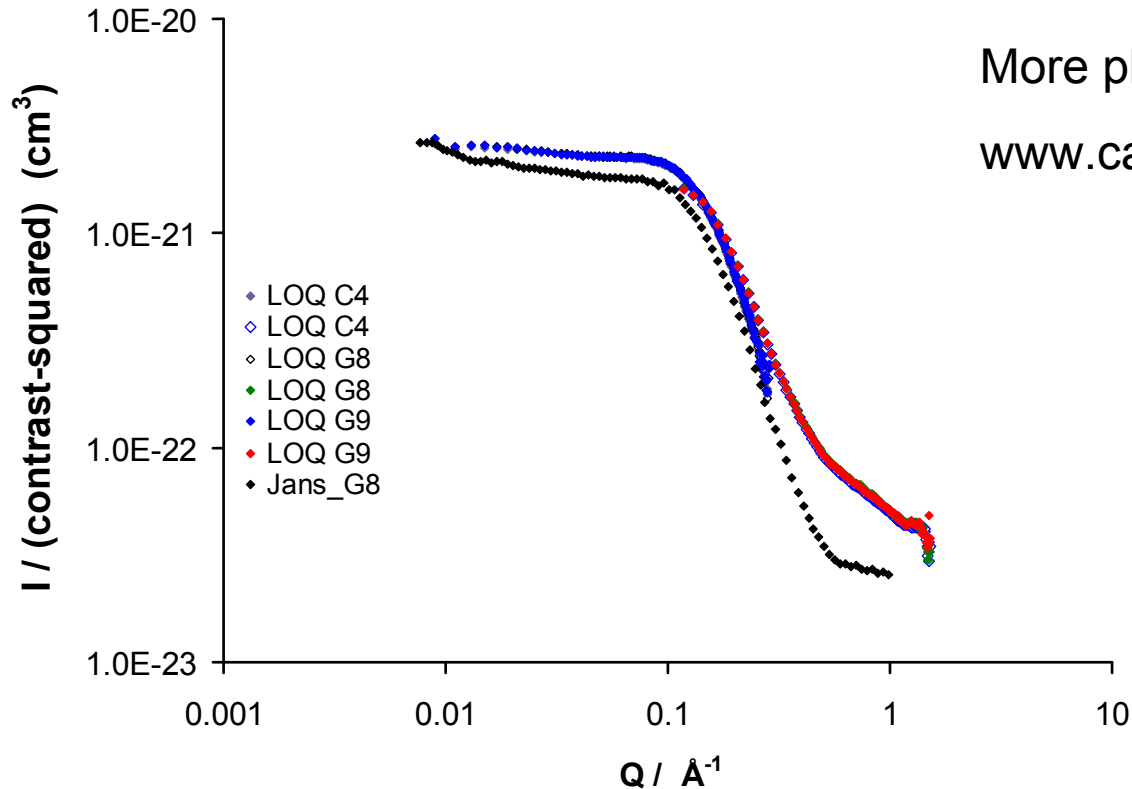
- Compare glassy carbon (samples distributed by Jan Ilavsky)
- Polystyrene latex – round robin measurements



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Glassy Carbon

APS / LOQ Glassy Carbon Round Robin

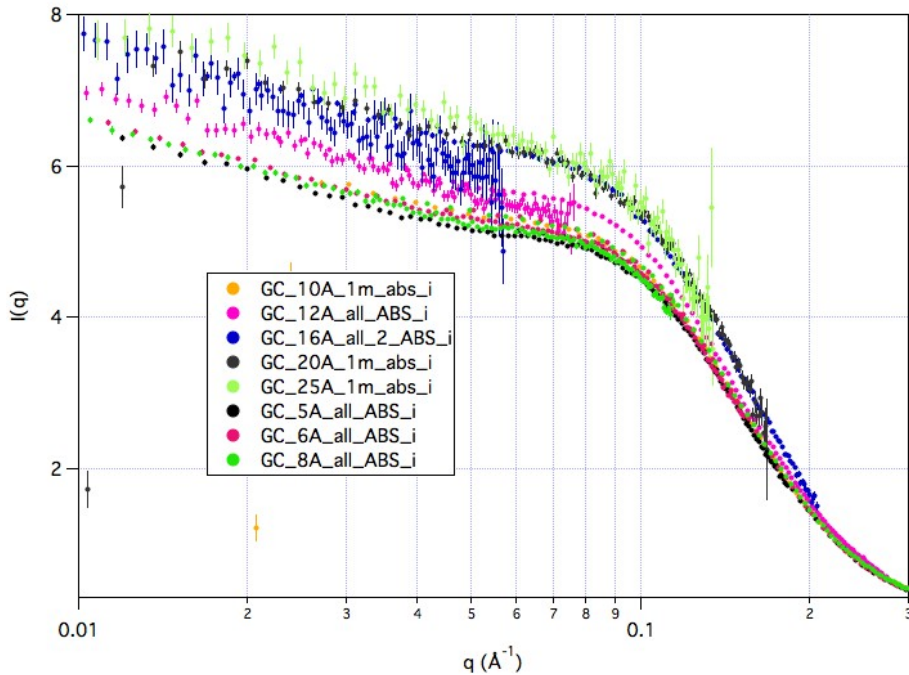


Compare X-ray and neutron data



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Glassy Carbon



Wavelength – some
unexplained variations

Multiple scattering
needs attention

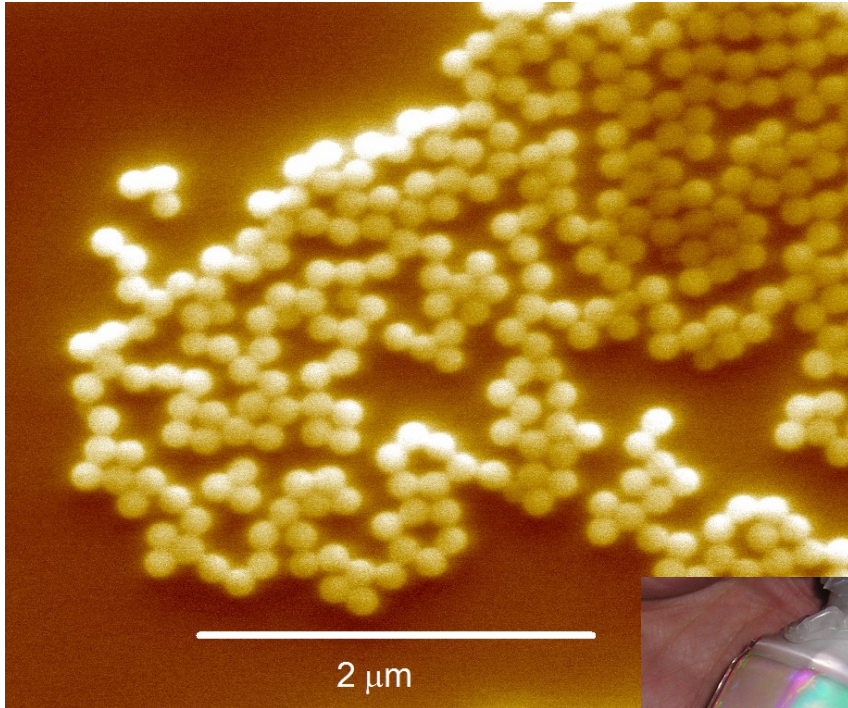
NCNR September 2012

J. G. Barker et al



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Round Robin Polystyrene Latex

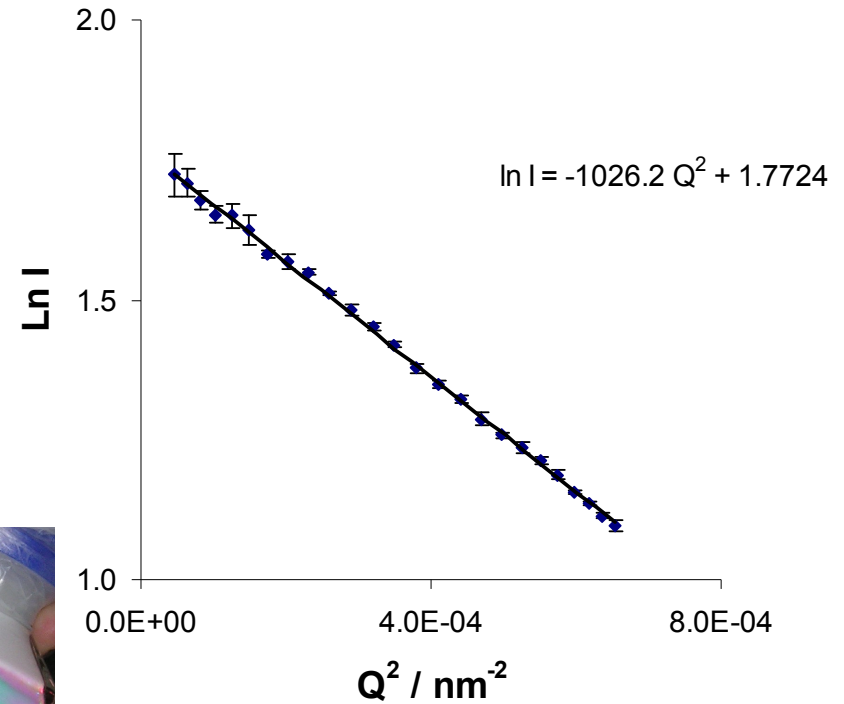


SEM 5 keV uncoated
latex on Si wafer

8% - Diffracts light



PS3 Polystyrene latex in D₂O



Static light scattering – ALV
HeNe laser $R_g = 56 \text{ nm}$

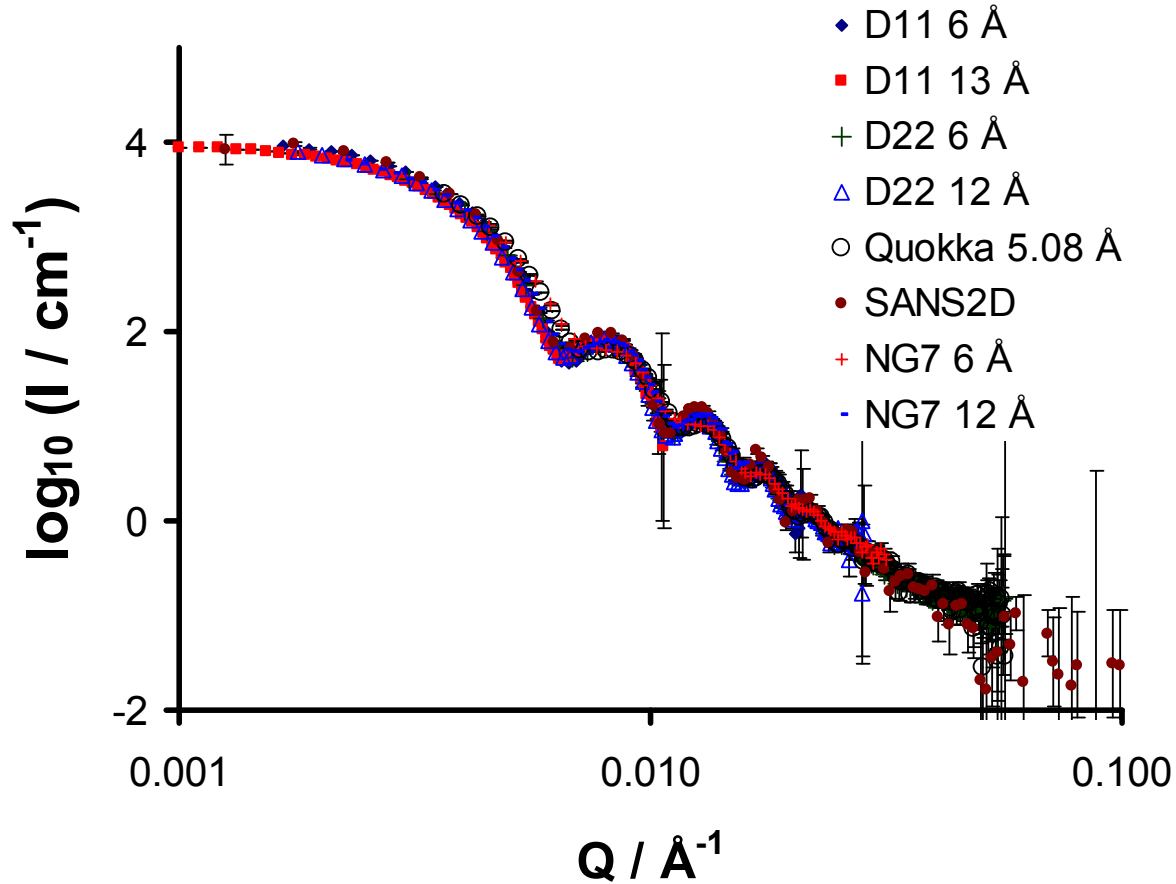
$R = 716 \text{ \AA} \pm 2 \text{ \AA}$



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0.43% Latex in D₂O

1 mM NaCl

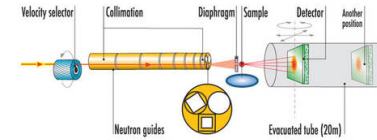
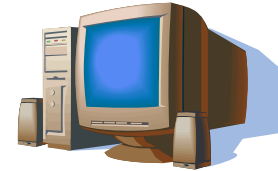
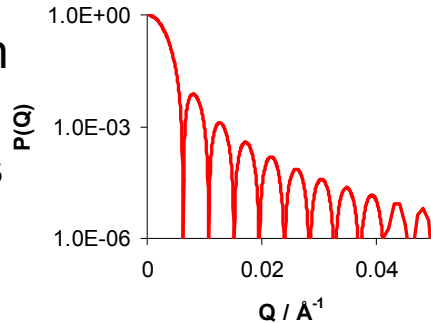




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Conclusions – What have we learnt?

Data that can be modelled reliably helps comparisons



Compare instruments and software

Systematic deviations are often the largest source of uncertainty in interpretation

Different reference samples needed for different purposes

Need to document results in publications



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Recommendations

- Regular comparisons of instruments and procedures as well as software are helpful
- Data formats and publishing standards need to include uncertainty from systematic effects as well as counting statistics
- Descriptions of data are essential - e.g. how is resolution described, σ , FWHM etc.?
- Stable / 'sealed' sample for long term reproducibility would be helpful



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Ongoing and New Activities

- Round Robin
 - Protein Solution – different Q and I range
 - GiSAS – reference sample for measurements and data analysis
- Software
 - Comparison
- Your ideas welcome



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More information

www.cansas.org

Thank you for listening

