Residual stresses that develop during manufacture and machining can have a significant impact on the final product, often leading to distortion, the need for costly additional working or machining, heat treatment or rejection due to tolerances not being met. They also have an impact on the in service performance which must be accounted for, and are probably one of the most common causes of the sudden, unexpected failure of engineering components.

The workshop will bring together internationally recognised experts from academia and a range of manufacturing sectors to discuss the challenges, techniques and approaches for the measurement, modelling and management of residual stress and distortion. The latest developments and state of the art measurements will be covered using a series of case studies, and it is expected that the multi-sectorial approach will provide excellent opportunities for the cross-fertilisation of ideas and methodologies.

Poster presentations are invited on topics relevant to the theme of the seminar. Please produce an A1 portrait poster for the event. Please indicate on the registration form if you wish to present a poster. Spaces for posters are limited and allocations will be made on receipt of registration fee.

The meeting is aimed at engineers and scientists with an interest in residual stress and manufacturing, looking to develop a better understanding of the range of measurement techniques available and the different approaches to support their own applications and research interests.

The meeting will also include a tour of the impressive AMRC facilities and an exhibition of relevant manufacturers and equipment suppliers.

**Provisional Programme**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.30 - 10.00</td>
<td>Registration</td>
</tr>
<tr>
<td>10.00 - 10.10</td>
<td>Welcome and Introduction</td>
</tr>
<tr>
<td>10.10 - 10.50</td>
<td>Phil Withers – Manchester University</td>
</tr>
<tr>
<td>10.50 - 11.20</td>
<td>Tony Phipps – Rolls-Royce</td>
</tr>
<tr>
<td>11.20 - 11.50</td>
<td>Jesus Talamantes-Silva – Sheffield Forgemasters</td>
</tr>
<tr>
<td></td>
<td>Exhibition, poster session, lunch &amp; tours</td>
</tr>
<tr>
<td>2.00 - 2.30</td>
<td>Simon Smith – TWI</td>
</tr>
<tr>
<td>2.30 – 3.00</td>
<td>Sabino Ayvar-Soberanis – AMRC</td>
</tr>
<tr>
<td>3.00 – 3.30</td>
<td>Tom McLeay – AMRC</td>
</tr>
<tr>
<td>3.30 – 4.00</td>
<td>Udi Woy – Nuclear AMRC</td>
</tr>
<tr>
<td></td>
<td>Tea and Close</td>
</tr>
</tbody>
</table>

**Pricing**

- BSSM and co-sponsoring Members: £120+VAT
- Non members*: £170+VAT
- Student member: £60+VAT
- Student non member*: £80+VAT

* Non member rates include BSSM membership until 31st Dec 2016
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.30 - 10.00</td>
<td>Registration</td>
</tr>
<tr>
<td>10.00 – 10.10</td>
<td>Welcome and Introduction</td>
</tr>
</tbody>
</table>
| 10.10 - 10.50| **Prof Phil Withers**  
Interim Chief Science Director, The Sir Henry Royce Institute for Advanced Materials, University of Manchester  
“Residual Stresses: Origins, Measurement and Mitigation”  
In this talk I will look at what residual stresses are, why they matter and how they are introduced. In addition I will look at ways of measuring residual stresses focusing primarily on methods that can be used in the lab or field. I will consider the effect of residual stresses on subsequent manufacturing steps (e.g. machining) and on ultimate properties. Finally I will look at ways of mitigating residual stresses or re-engineering them to improve the performance of manufactured products. |
| 10.50 - 11.20 | **Dr Tony Phipps**  
Chief of Materials and Process Modelling Capability, Rolls-Royce, Derby  
“Residual Stress Prediction in Industry & Future Needs”  
This talk will illustrate examples of successes in predicting residual stresses and using these in industrial environments. This will be primarily on High Integrity Aerospace forgings and cover bulk and surface residual stresses. It will also describe some of the challenges for the future, both technical and interaction between organisations. |
| 11.20 - 11.50 | **Prof Jesus Talamantes-Silva**  
Managing Director, Sheffield Forgemasters, Sheffield  
“Distortion during the Manufacturing of Ultra Large Components”  
The talk will cover the use of computer simulations to support the manufacturing of large casting and forgings. In particular, the techniques that Sheffield Forgemasters use to qualitatively predict distortion and residual stresses in such components. To that effect I am going to be showing some case studies which highlight the challenges we face and how we go about solving them. |
| 11.50 - 12.00 | Exhibition, Poster session, lunch & tours                               |
| 11.20 - 11.50 | **Dr Simon Smith**  
Technology Manager Numerical Modelling, TWI, Cambridge  
“Welding Distortion Estimation Techniques”  
The presentation will give a brief overview of simplified methods for welding distortion prediction and the manner in which these might be used in fast analyses for the prediction of welding distortion. The presentation will also describe the meaning of welding symbols. It is envisaged that simplified methods could form part of an algorithm for distortion predictions embedded within the design process. This possibility will be discussed. |
| 2.00 – 2.30   | **Dr Udi Woy**  
Nuclear AMRC, Sheffield  
“Residual Stress Factors in Strategic Layering Techniques”  
The talk will focus on residual stress factors and distortion in strategic layering techniques. The effects of the processing mechanisms and conditions in controlling these will be explored to highlight current challenges and key developments in this area. |
| 2.30 – 3.00   | **Dr Sabino Ayvar-Soberanis**  
Technology Fellow, Machining Group. Process Modelling & Residuals Stress Measurements University of Sheffield & AMRC  
“Managing Part Distortion for Aerospace Components”  
The presentation will provide an initial overview of the impact of distortion part rejection, lead time, and production costs. Then I aim to discuss the important role of the Finite Element modelling tools and measurements capabilities for part distortion management for aerospace components. |
| 3.00 – 3.30   | **Dr Tom McLeay**  
Head of Core Research, The Machining Group, AMRC Sheffield  
“Ensuring conformance of critical parts using in-process measurement and tool path compensation”  
There are many factors that affect the capability of machining processes to achieve an accurate dimensional tolerance on finished components. Tool wear, tool deflection, part deflection, machine kinematic error and part distortions are amongst the most challenging issues faced by the aerospace industry. This presentation will discuss the applied solutions that industry are adopting to maximise the dimensional capability of their processes, whilst ensuring manufacturing cost and time remains competitive. |
| 3.30 – 4.00   | **Dr Tom McLeay**  
Head of Core Research, The Machining Group, AMRC Sheffield  
“Ensuring conformance of critical parts using in-process measurement and tool path compensation”  
There are many factors that affect the capability of machining processes to achieve an accurate dimensional tolerance on finished components. Tool wear, tool deflection, part deflection, machine kinematic error and part distortions are amongst the most challenging issues faced by the aerospace industry. This presentation will discuss the applied solutions that industry are adopting to maximise the dimensional capability of their processes, whilst ensuring manufacturing cost and time remains competitive. |
| 3.30 – 4.00   | **Dr Tom McLeay**  
Head of Core Research, The Machining Group, AMRC Sheffield  
“Ensuring conformance of critical parts using in-process measurement and tool path compensation”  
There are many factors that affect the capability of machining processes to achieve an accurate dimensional tolerance on finished components. Tool wear, tool deflection, part deflection, machine kinematic error and part distortions are amongst the most challenging issues faced by the aerospace industry. This presentation will discuss the applied solutions that industry are adopting to maximise the dimensional capability of their processes, whilst ensuring manufacturing cost and time remains competitive. |
Travel Details
AMRC is around 15 minutes by taxi from either Sheffield or Rotherham railway station. The TM Travel A1 bus service between Sheffield and Rotherham stops close to AMP (Waverley).

The nearest airports are Robin Hood (Doncaster); East Midlands; Leeds Bradford; and Manchester.

Hotels
If you need to stay overnight, AMRC can recommend the following hotels:

Holiday Inn Royal Victoria Sheffield, tel: +44 (0)114 276 8822. Ask for the University of Sheffield corporate rate. www.holidayinn.com/hotels

Holiday Inn Express Sheffield, tel: +44 (0)114 252 6500. Ask for the University of Sheffield corporate rate.

Sheffield Metropolitan Hotel, tel: +44 (0)114 220 4000

Carlton Park Hotel, tel +44 (0)1709 849 955 sheffield-metropolitan.h-rez.com/
Booking Information

Please complete and return to
Amanda Boaler, Society Manager
2 Craven Common, Uffington, OXON, SN7 7RN
or email info@bssm.org
Tel: +44 (0)7756 915295

Name: ____________________________________________
Institution: _______________________________________
Address: _________________________________________

Postcode: ____________________________ Tel: __________
e-mail: ________________________________

I will be displaying a poster __________ Title of poster _______________________

Payment Method

1. By cheque: Please make cheques payable to:
   BRITISH SOCIETY FOR STRAIN MEASUREMENT

2. We can invoice your company.
   Please send us a Purchase Order.
   Order No: ______________________________________

3. Pay by credit/debit card (NOT AMEX):
   Card No. _______________________________________
   Start date: __/___ Expiry date: __/___
   Issue No. (Switch/Maestro only) ____________
   *Security Code ____________
   *Last 3 digits on back of card

Fees

BSSM & Co-sponsor Members £120+VAT* ________________________
Non Members £170+VAT ________________________
Student Member £60+VAT ________________________
Student Non Member £80+VAT ________________________

Alternatively become a BSSM member and attend the meeting at the member rate.

Fees (inclusive of VAT)

Individual membership £60.00 ________________________
Corporate 1 Industrial £894.00 ________________________
Corporate 2 Industrial £452.00 ________________________
Corporate 2 Educational £300.00 ________________________
Retired/Student £36.00 ________________________
SEM (joint) membership £45.00 ________________________

Contact: info@bssm.org