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AILU

THE LASER USER

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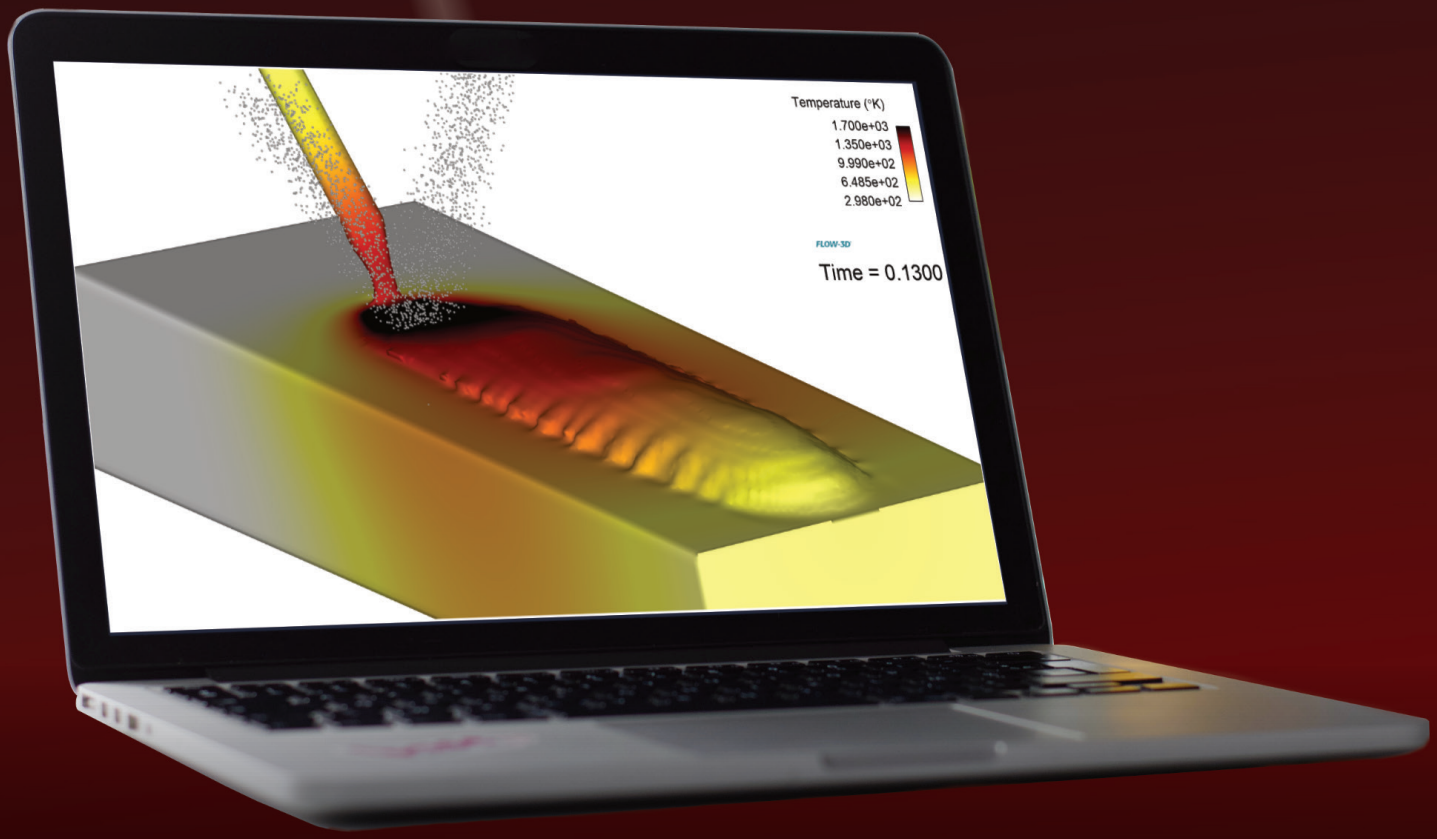

HIGH POWER LASER WELDING:

BEAM SHAPING, ULTRASONICS & AUTOMOTIVE APPLICATIONS

THE LASER USER

Editor: Dave MacLellan
Sub-Editor: Catherine Rose

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The Laser User is the house magazine of the Association of Industrial Laser Users. Its primary aim is to disseminate technical information and to present the views of its members. The views and opinions expressed in this magazine belong to the authors and do not necessarily reflect those of AILU.

The Editor reserves the right to edit any submissions for space and other considerations.

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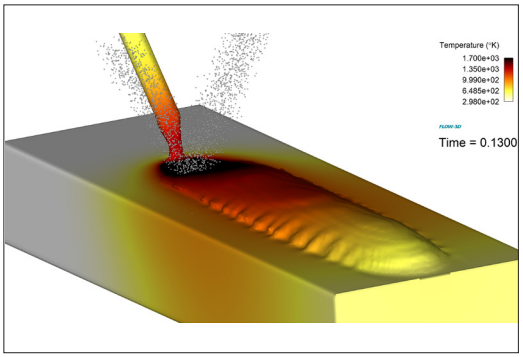

Cover image: Melt pool simulation of wire/powder deposition additive manufacturing in FLOW-3D AM

Courtesy Flow Science UK Ltd

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Past presidents and founder members are also able to attend committee meetings. Anyone wishing to join the AILU Steering Committee please contact the Executive Director.

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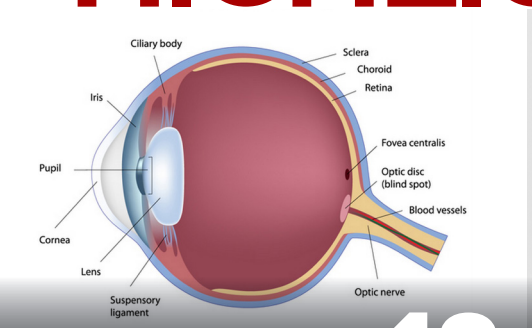

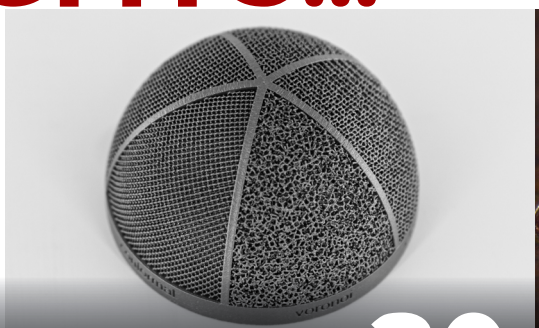

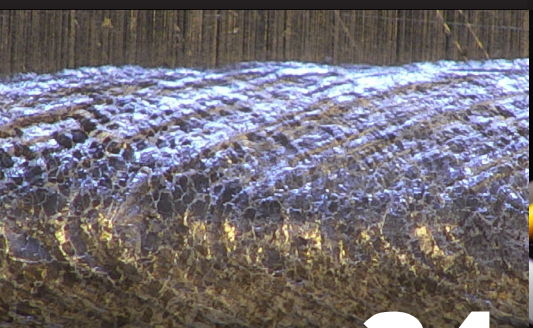

ASSOCIATION NEWS

FIRST WORD

Between our last issue and ILAS 2023, we have a very busy period of events and look forward to seeing more members as presenters, delegates and exhibitors. Particularly exciting is the development of our Early Careers Researchers Group which sees them presenting to each other (and other delegates) on the topics of their research. As they return to meeting in-person, it is great that they get to know each other and form working relationships and friendships that I expect in many cases will last for the rest of their careers.

Diversity and inclusion are enhanced by our younger members, and I am particularly excited that we have an equal number of female authors as male authors for the 6 articles in this issue. It would be great to see the number of female members increase to redress the typical balance of our industry and events (we normally have 80-90% male audiences and presenters). Please help me to encourage new and notable speakers for ILAS and our other workshops. I am always disappointed to attend events with an all-male platform – it is never by design! I look forward to seeing you at ILAS or before.

Finally, as we prepare for our Job Shop Annual Business Meeting, I would like to take this opportunity to thank Mark Millar who has been the Chair of this group since 2015 and is now standing down. Mark has also served on the Steering Committee and been a strong supporter of AILU through the years and I personally really appreciate all that he has given to AILU. If you run a laser job shop, make sure you come along to the meeting this year –to learn about improvements to your business as well as network with peers and suppliers.

Dave MacLellan
dave@ailu.org.uk

PRESIDENT'S MESSAGE

Greetings and welcome to another issue of The Laser User magazine. I am writing this month's welcome from British Columbia where I have recently started an academic position after 13 years at the University of Nottingham. Most of this time was spent as an AILU member during which I have seen several changes in the commercial and research landscapes associated with laser technology. In some ways the laser has become "de rigueur" in the high value (and not so high value) manufacturing sector and this can be attributed to three principle factors in my mind; i) increased competition and new technology reducing prices for laser sources, ii) significant advances in the ancillary technologies (controls, safety, optics) which facilitate uptake, and iii) the incorporation of lasers into automated production solutions. Now that 'we' and 'the laser' are no longer 'outsiders' where can AILU go from here?

As I make a new start professionally, I am reminded that my time as President of the Association will come to an end in 2023. This provides an opportunity to strategically consider how we serve our members and the laser industry better. Since summer 2021 Mike Poulter, Dave MacLellan and I have been giving this careful consideration and have been in discussion with stakeholders across AILU. Working with these members we are forming proposals as a board, to consider opportunities to work with peer group trade organisations to elevate our position in the broader landscape of manufacturing technology. This is very much a work in progress and we hope to report more news early in the New Year, but we are optimistic this will allow our membership new opportunities in laser business and innovation.

Adam Clare
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RIC'S RAMBLINGS

Now that the nights are fully drawing in and the house lights and heating are reluctantly switched on, I would like to talk about energy. Not just any old energy, but Fusion Energy. Yes, this is the thing that as the joke goes is always 30-50 years away. I recently attended Fusion 22 - a one-day event organised by the Fusion Cluster. The first thing that struck me was the large number of attendees - some 200 or so in person at the Science Museum in London and a further 800 people online - gathered together to talk about something that not that long ago attracted the attention of a very few select plasma physicists. Clearly something big has happened between now and 20 odd years ago when I was dabbling with high power lasers to try to work out the physics of Fast Igniter Fusion. That big thing, I am now convinced, is need! Goodness me we are in need of a serious energy revolution - 2050 when we are supposed to be net zero is less than 10,000 days away.

For the uninitiated, fusion is the process whereby you get a shed load of energy (hopefully more out than you put in) by fusing deuterium with tritium (other fusion reactions are available). This process essentially generates heat that in turn boils water to generate steam that drives a turbine and produces electricity. Hey presto and away you go… Problem is it turns out that you need the product of temperature x density x time to exceed a certain value and typically that means temperatures of around 100 million degrees! It is after all the process by which stars, including our very own sun, shine. Here on earth making that happen is not easy. Containing the plasma has been likened to trying to squeeze jelly together with your hands - we all know how that ends up. There are lots of different schemes, the main 2 being magnetic confinement (tokamaks) and inertial fusion (lasers).

The good news is that recently there have been big scientific and technological breakthroughs in both fusion schemes that indicate that we really might have a working fusion based power station in the not too distant future. Encouragingly there are also quite a number of fusion start-up companies that are attracting significant investment so the momentum is really building now.

So why am I banging on about Fusion? Well there are massive opportunities for lasers, optics, photonic based systems, not just the high power lasers required for inertial confinement but also lasers for use in new materials development and characterisation, surface modification, welding, micro-machining, diagnostics… the list goes on. I would encourage you to take a look at the fusion landscape and see if there is anything in it for you and your organisation. Fusion is coming and we in the laser industry should be ready to take opportunities and be part of this incredibly exciting and game changing energy revolution.

Ric Allott
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