Defects in AM: Don’t (just) blame the metals - it's (sometimes) the way they are made

ABSTRACT
The combination of challenging process conditions and metallurgical complexity creates the “perfect storm” for the Additive Manufacture of the highly engineered and process sensitive alloys that metallurgists delight in creating. Luckily, metallurgists also have strategies at their disposal to make materials “more processable” - applying understanding from the knowledge and understanding we can apply from casting and forging. But what if the process itself were also somehow to blame? How would the machine manufacturers know? And if we could advise them what would tell them to do differently? More importantly how might we work with the machine designers and data scientists, physicists and exert control? In this talk I will explore the problems that laser and electron beam AM powder processing of materials present and look to what we as a community can do to drive the technology forward - and, importantly how we might use this newfound control to exploit the process to enable us to manipulate structures and properties of alloys in ways that are unprecedented.

BIOGRAPHY
Iain Todd is based at the University of Sheffield where he directs the EPSRC Future Manufacturing Hub using Advanced Powder Processes (www.MAPP.ac.uk). He held positions in Industry and as a research fellow in the Netherlands and Spain prior to joining Sheffield as a Lecturer. His work lies at the interface between manufacturing technology and materials processing science and concerns the development of understanding of underlying physical principles related to materials processing to better control material form, integrity and function and hence economic value. Research in his group is conducted in close collaboration with Industry and on an appropriate scale to allow rapid transition of new laboratory discoveries into industrial practice.