

SESSION 8a:
THERMAL DESIGN II
Chairs: Andy Souzis, *II-VI*
Martin Kuball, *University of Bristol*

This session will continue the theme of the Thermal Design I session, in exploring improvements in thermal device management as well as thermal limitations to device operation. We focus on novel thermal design concepts, including further diamond materials integration on chip, device packaging and advanced thermal simulations developments and applications. Naval Research Laboratory reports on the benefits of diamond capping GaN electronics for heat sinking the devices, and challenges in device fabrication to consider. A further application of diamond, namely its use not in chip but in metal-diamond composites is explored by Georgia Tech, looking at benefits of these composites for example for die attached HPAs. In a further presentation the development of diagnostic structures particularly suited for GaN devices as test and evaluation tools is discussed to reduce packaging and thermal management system development cycles. University of Parma reports on thermal simulation development focused on that modeling cannot be confined to the device alone needing to consider also package, the heat sink, and finally the board, making a finite element model rather large. A lumped-element thermal model is developed to enable improved and simplified device simulations. Finally, TriQuint reports on the impact of the temperature non-uniformity within the finger on the InGaP/GaAs HBT safe operating area and on thermal “runaway”.

