



THERMINIC<sup>2021</sup>

THERMINIC  
2021  
Online Live Day  
23 September

**2021 27TH INTERNATIONAL WORKSHOP  
ON THERMAL INVESTIGATIONS OF ICS  
AND SYSTEMS (THERMINIC)**

September 13 – October 8, 2021

**PROCEEDINGS**

Technical sponsors:





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# Welcome to Therminic 2021

This 27<sup>th</sup> edition of THERMINIC is again the main European event for academics and industry to share recent advancements in thermal issues of electronics and microelectronics, including problems of nano-scale heat-transfer, thermal modeling and simulation and characterisation issues e. g. in solid-state lighting as well as cooling issues of power electronics.

Following the workshops held in Grenoble (1995), Budapest (1996, 2000, 2007, 2012 and 2016), Cannes (1997 and 1998), Rome (1999), Paris (2001, 2011 and 2015), Madrid (2002), Aix-en-Provence (2003), Sophia Antipolis (2004), Belgirate (2005), Nice (2006), Rome (2008), Leuven (2009), Barcelona (2010), Berlin (2013), Greenwich (2014), Amsterdam (2017), Stockholm (2018) and Lecco (2019), the workshop took place virtually in 2020 for the first time due to the pandemic, with the workshop's mission control room set in Berlin, Germany.

With the world still within the grip of the coronavirus, it has unfortunately become clear in recent months and weeks that we will still not be able to hold a live THERMINIC Workshop this year. For this reason, and with the good experience of last year, we have decided to carry through THERMINIC again as an online event, combining pre-recorded video presentations with an exciting and interactive digital conference format.

So this year we are staging a workshop which features once again a strong technical program, encompassing 14 live presentations organised in 5 oral sessions and four pre-recorded presentations introduction sessions, plus four vendor talks. More than 100 conference delegates from 23 countries are joining us this year.

Again we offer a proceedings volume for download. As you will see, it includes all the sessions and presentations as you would expect.

As we have again decided to run the live part of the conference within one day, we have reserved the intro to the conference for one industrial keynote lecture. We have the pleasure to welcome Dr. Markus Klingler (Robert Bosch GmbH), who will showcase future trends and challenges in power electronics for battery electric vehicles.

With the event being virtual, I am very sorry indeed that we cannot invite you to a social event or cocktail dinner as it has been the tradition of previous Therminics for more than a quarter of a century. We all do hope that we can go back to this next year.

Our thanks go to the authors for their presentations and to all reviewers as well as to the members of the scientific committee for soliciting and selecting the right mix of contributions. We are also very grateful to our industry sponsors for their support of THERMINIC 2021 who stayed faithful to us throughout the last two years affected by corona. Last but not least, we would like to thank the teams from Fraunhofer ENAS, Berliner Nanotest & Design GmbH, BTU Cottbus and mcc Agentur für Kommunikation GmbH for all their help in the organisation of THERMINIC 2021.

We look forward to an inspiring day online with you at THERMINIC 2021 this year.

Bernhard Wunderle  
*Program Chair*



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