

# Towards integrated computational materials engineering



Roger Assaker, CEO  
MSC Software

Greetings readers. As many of you may know, Paolo Guglielmi was promoted to be President of Hexagon Manufacturing Intelligence in February, the larger division that MSC Software is a part of inside Hexagon AB. And it my pleasure to take over Paolo's role inside MSC Software reporting to Paolo. Many of you will know me from my leadership of e-Xstream Engineering, the market leader in materials simulation, which I founded in 2003. I intend to bring the passion and the vision of what we have achieved in Materials to the broader CAE portfolio that is the ever expanding MSC Software. I have a background in aerospace engineering with a PhD in CFD and extensive CAE touch-points over the years. We are in a time of rapid change inside manufacturing with the boundaries expanding and fusing between Industry 4.0, Big Data, Digital Twins and Generative Design to name a few mega trends. I believe that with Hexagon and MSC's portfolio, we have a unique offering to make all product manufacturing processes in all industries both smarter but

more efficient, more productive and increasingly more sustainable. You, our loyal customers, are the reason for our success and I would ask you to join with us in this journey as we grow together in the brave new world of autonomy and digital transformation that is coming soon.

I also want to welcome two new additions to the Hexagon MSC family of solutions – Volume Graphics (page 75), the market leader in industrial CT-scanning, and CAEFatigue who lead the way in structural fatigue modeling. And with Hexagon's announcement of the acquisition of Romax Technologies in February which closed in June, we have a burgeoning span of design & engineering simulation solutions to offer the market and many unique multiphysics solutions and toolchains. Moreover, I am excited to see our recent release of VTD Scale, the first cloud-based offering of our software, for simulating millions of scenarios in virtual test driving of ADAS and autonomous systems in cars on Amazon and Microsoft Clouds. It is described on page 77 by Michael Schlenkrich.

In this edition of Engineering Reality Magazine, our lead theme is a topic close to my heart and a fast emerging area of science inside CAE: Integrated Computational Materials Engineering (ICME), where we have a market leading solution. I commend to you our Q&A with my friend Prof. Pedro Camanho of Porto University; a global thought leader in composites with many insights, a story from Sovitec in Belgium who reduced costs by 20% with their use of Digimat, Markforged who have produced lightweight 3D printed polymer parts, and a commentary from one of the founders of e-Xstream Engineering, Dr. Issam Doghri. I would also encourage you to check out our unique 10xICME solution initiative to improve product quality, manufacturing productivity and cost savings in ICME by an order of magnitude. Do also go to our website and download our ICME e-Book. I am always fascinated by some of the more extreme applications of our software, but surely one of the most fascinating has to be that of Northumbria

University in the UK (page 24) who have used Marc to simulate underlying tidal stresses below an ice shelf off the coast of Antarctica the size of Sweden! This echoes the Sustainability theme of our last magazine, as does the work of Tokhai University in Japan on an award-winning Solar Car design used in a trans-Australia road race without carbon-based fuels (page 20) to show that the existential challenge of sustainability have not gone away as the world focuses on the current Coronavirus crisis.

This magazine also sees several excellent cutting-edge applications such as from Hyundai Heavy Industry on the structural stresses of Offshore Platforms (page 27), The North Face jacket airflows from Goldwin (page 34), Schlinder Lifts for the multiphysics of fluids and acoustics (page 38), Thales (page 65) and Ultratech (page 72) who employ our manufacturing solutions, and Volvo (page 58) Airbus (page 41) and Ford (page 44) all report successes with our Adams multibody dynamics software. Our Marc nonlinear FEA code is well represented by stories from Japan on stent simulations (page 30). Our own Hexagon Leica cameras have been simulated by Cradle CFD to improve their thermal performance (page 54). Also a fascinating story from BAIC in China of how they use the gold standard acoustics simulation package, Actran, to improve automobile performance (page 50).

Finally, we continue to develop our cutting-edge solutions for Autonomous Mobility and Additive Manufacturing as outlined in the commentaries by my executive colleagues, Sridhar Dharmarajan (page 48) and Philippe Hebert and Anthony Cheruet (page 13) in this magazine. Gereon Deppe also describes our exciting Generative Design developments within MSC Apex (page 81) where we have integrated new technologies into the cool user experience that is the MSC Apex platform.

Stay safe!

A handwritten signature in black ink, appearing to read 'Roger Assaker'. The signature is fluid and cursive, with a large loop at the end.