

## **FOREWORD** **PRESIDENT & CEO OF SIRIM BERHAD**

Bismillahir Rahmannir Rahim

It gives me great pleasure to welcome all participants of the Advanced Materials Conference (AMC 2012) organised by Advanced Materials Research Centre (AMREC), SIRIM Berhad. I would also like to congratulate the committee members from AMREC for taking up the challenge of hosting this event.



As a quality, research and technology institution, SIRIM needs to exploit and leverage upon all possible areas of opportunities and outputs. Through conferences and seminar such as AMC 2012, research outputs can always be presented and later realised as publications that serve to enrich the existing body of knowledge of this field. Interactions during the conference can further stimulate research ideas, provide opportunities for research co-operation and enable the stakeholders to network and exchange information and knowledge. With AMC 2012 focusing on advanced materials science and engineering, it also plays the role of transforming abstract concepts into useful technology and, as such, preserves and expands the innovation. It is hoped that individual researchers, particularly those from SIRIM will work hand in hand, in developing this important field of research and pushing it together to be the most important vehicle for value creation within the whole society.

I would also like to congratulate all the researchers who have achieved their desired results in their research work, and I hope their findings will be translated into practical use in the relevant commercial fields, thus benefiting our nation and others beyond our borders.

Finally, I would like to express my sincere thanks to the organising committee from AMREC for their efforts in organising this conference. To all participants, wishing you a successful conference and have a pleasant stay in Langkawi, Kedah.

Thank you.

A handwritten signature in black ink, appearing to read "Zainal Abidin Mohd Yusof".

Dr. Zainal Abidin Mohd Yusof  
President & Chief Executive  
SIRIM Berhad

## MESSAGE FROM CHAIRMAN OF THE ORGANIZING COMMITTEE AMC 2012

Assalamualaikum w.b.t and warmest greetings to all,

It is my great pleasure to welcome you all to the Advanced Materials Conference 2012 (AMC 2012) which will be held in fascinating Langkawi Island on 12 -13 of December 2012.

AMC 2012 is held with the aim of being a platform for reviewing the latest research and technology in the area of Advanced Materials. It also to bring together researchers, scientists, engineers and scholar students to exchange and share their experiences, new ideas and results in all aspects of Advanced Material Research and discuss the practical challenges encountered and the solutions adopted. Latest advances and innovation in the area of advanced material will be discussed. A total of more than 100 scientific papers in various field of Advanced Materials have been received and accepted for presentation in this conference.



I also hope that this conference will encourage smart partnership between research institution, universities and industries. AMC 2012 is not just about the presentations of the research finding, but most importantly are the networking and renewing partnership.

I would like to take this opportunity to congratulate the organizing committee for their hard work in making this conference successful. To all our sponsors, I would like to express our endless gratitude and thanks. Your generous support and contributions has made this conference a success.

Last but not least, on behalf of the Organizing Committee of AMC2012, we welcome all of you to this conference. We truly value your participation and support for this conference.

Thank you

A handwritten signature in black ink, appearing to read "Dr Mohd Afian Omar".

Dr Mohd Afian Omar  
Chairman of AMC2012

## **ORGANIZING COMMITTEE**

### **Patron**

Dr. Hj. Zainal Abidin Mohd Yusof  
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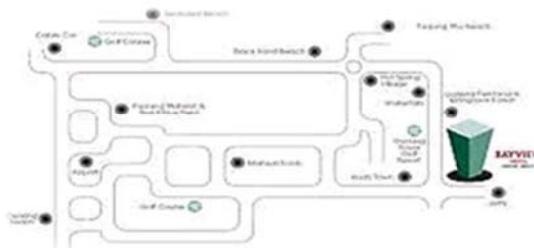
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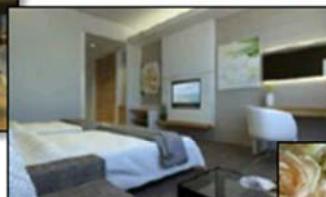
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	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	
	<b>W</b>	<b>up</b>	<b>up</b>	
	<b>Re</b>	<b>uq</b>	<b>uq</b>	
	<b>Os</b>	<b>ut</b>	<b>ut</b>	
	<b>Hf</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Ta</b>	<b>Ds</b>	<b>Ds</b>	
	<b>W</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Re</b>	<b>Ds</b>	<b>Ds</b>	
	<b>Os</b>	<b>Rg</b>	<b>Rg</b>	
	<b>Hf</b>	<b>Cn</b>	<b>Cn</b>	
	<b>Ta</b>	<b>U</b>	<b>U</b>	