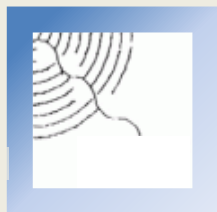


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E-NEWSLETTER

September 2021 issue

THE SOCIETY OF ACOUSTICS SINGAPORE

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Year of Registration: 1989

President: Dr Gan Woon Siong
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I. CONFERENCE NEWS

. The 28th International Congress on Sound and Vibration (ICSV28) will be held in Singapore from 24 to 28 July 2022 and will be a hybrid conference.

Woon Siong Gan will be organising three structured sessions on:

1. Nonlinear acoustics and vibration
2. Acoustic metamaterials & phononic crystals: fundamentals and applications

3. Sound propagation in curvilinear spacetime

Please visit www.icsv28.org for more informations.

II.ANNONCEMENTS

The Society of Acoustics(Singapore) will be sending out invoices to members with outstanding membership subscriptions. Members are encouraged to make payment in support of the Society.

The E-Newsletters will be made available to industrial contacts in an effort to promote the activities of the Society.

The Society is also exploring the possibility of organising zoom seminars/workshops and other professional events in collaboration with acoustic societies of the ASEAN countries.

Membership Certificates will soon be made available to all members who had made full payments of membership dues

The Society aims to increase membership by inviting all persons, including those from the institution of higher learning and other related societies such as the Institute of Architects, Singapore and the members of the mechanical engineering division of the Institution of Engineers, Singapore who are qualified in the various field of Acoustics to join our Society.

We are especially keen to invite students to join our society and we are establishing the Youth Chapter soon.

III.INTERNATIONAL ACOUSTICS NEWS

International Year of Sound(IYS) 2020-2021 Student Competition

The IYS Steering Committee has processed the votes received from both the Expert Jury and the Popular (Web) Jury and we are happy to announce that awards and special mentions have been assigned to the winners of the International Year of Sound 2020-2021 Student Competition.

The adopted procedure for the evaluation process has considered sorting items for each category (I and II) from the most preferred to the least one, according to received preferences from the highest (1st) to the lowest (39th for drawings, 33rd for stanzas) for both experts and popular jury. Then, a decreasing sequential score from 39 (33) points to 1 point is assigned to each item in each category, and the weighting (70% expert votes and 30% web jury votes) is applied. Based on the final scores, the Steering Committee made the decision and assigned awards and special mentions.

WINNERS

Category I – DRAWINGS (Primary Schools)

1. Turkey (Istanbul) - School: Gekmekoy
2. Chile (Melipilla) - School: Colegio Melipilla
3. Hong Kong (Tung Chung) - School: Ching Chung Hau Po Woom

Category II – STANZAS (Middle and Secondary Schools)

1. Italy (Florence) - School: IC "Puccini" and Spain (Besalù) - School: Institut Escola Salvador Vilarrasa
2. Spain (Valladolid) - School: I.E.S. La Merced

We will directly contact the winners of the two categories for providing the grant, a Declaration of Commitment, and the Certificate of Participation. We remind that grants will be vouchers for books, educational materials or equipment for the value of 300 € (first prize), 200 € (second prize) and 100 € (third prize).

SPECIAL MENTIONS

Category I – DRAWINGS (Primary Schools)

- Croatia - Lotrščak primary school

Category II – STANZAS (Middle and Secondary Schools)

- Egypt - School: EBIS (Egypt British International School)
- Greece - School: 5° Senior High school – 1° Technical school of Corfù
- Portugal - School: Manteigas
- Russia - School: School 46
- Serbia - School: British International school

- Spain - School: I.E.S. La Merced
- Thailand - School: The demonstration school of Ramkhamhaeng University
- [DS.RU](#). Acapella
- Thailand - School: Bangkok Christian college – The 1852
- Thailand - School: Horwang school - Supawit
- USA - School: Home school
- Italy - School: IC Puccini
- Italy - School: Istituto Salesiano dell’Immacolata
- Spain - School: Cisneros

We will kindly ask you to forward the Special Mention Certificates to each school. National Representatives of the above-mentioned countries (Croatia, Egypt, Greece, Portugal, Russia, Serbia, Spain, Thailand, USA) will receive filled certificates in another email.

We would like to inform you that we are in the making of a short movie and a long one, which will summarize the story of the International Year of Sound, its global initiatives and, particularly, the Student Competition. In the videos, there will be assembled competition’s material, interviews, pictures, etc.

Many thanks for your contribution which has been fundamental for the success of the International Year of Sound Student Competition. We received contributions from 16 Nations all around the world. More than 650 items had been sent to NRs for the first category of the competition (drawings – primary school) and more than 50 items for the second category (stanzas - middle and secondary schools). There has been wide participation from the popular jury as well, with 4833 likes for the competition category I and 517 likes for the competition category II.

Please help us in giving huge diffusion to these data regarding participation. They are very significant. We all are very proud of them!

Don't hesitate to contact our office at competition@sound2020.org for any clarification.

Kindest Regards,

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ICA IYS 2020 - Competition Coordinator Office

Coordinator:

Sergio Luzzi

Office:

Chiara Bartalucci

Sara Delle Macchie

Rossella Natale

Paola Pulella

IV.MEMBERSHIP SUBSCRIPTION

Fellow	S\$70
Member	S\$50
Associate	S\$30
Student	S\$15
Corporate	S\$200

FEE BASED ON ANNUAL RATE

FOR MORE INFORMATION PLEASE CONTACT: Dr. Woon Siong Gan at
email: wsgan5@gmail.com

Membership application forms can be downloaded from the society website:
www.acousticssingapore.com. Please complete and email to
wsgan5@gmail.com

V.ARTICLES

**The following article is a brief version of my paper to be
presented at the ICSV28 in July 2022.**

My PhD Thesis Pioneered the Topological Phase Transition

Woon Siong Gan

1.Introduction

There are two approaches to topological phase transition: the
topological defects approach and the band theory

approach. . Both approaches show phase transition that does not follow the usual Landau theory of spontaneous symmetry breaking. The topological defects approach was introduced by Michael Kosterlitz and David J Thouless[1] in 1972, showing phase transition where topological defects play a crucial role. In the early 1980s, David J Thouless and F Duncan M Haldane [2] developed theoretical methods to describe phases of matter that cannot be identified by their pattern of symmetry breaking. Kosterlitz,Thouless and Haldane were awarded for the Nobel physics prize in 2016 for their works on topological phase transition.

In the band theory approach,band topology plays a critical role in phase transition. This revolutionized electron band theory[3] and revises the classical band theory with the inclusion of topology.

2.Band Theory

Energy band theory is one of the most important development of condensed matter and material physics which underlines the working principle of modern electronics and optoelectronic devices. It is well known that isolated atomic levels would spread to form energy bands when atoms were brought together to form a solid[4] which provides a general band evolution process to understand metal, semiconductor, and insulator states.

Free electron model for metal has spherical energy surface. The free electron model is the simplest way for representing the electronic structure of metals. According to this model, the valence electrons of the constituent atoms of the crystal structure become conduction electrons and travel freely throughout the crystal. Therefore, within the model we neglect

the interaction of conduction electrons with ions of the lattice and the interaction between the conduction electrons. The free electron model gives rise to a spherical energy surface.

Semiconductor has a warped energy surface. The change in the topology of the energy surface gives rise to phase transition from metal to semiconductor. Hence this is a form of topological phase transition.

My PhD thesis [5] introduced the warped energy surface model for semiconductor compared with the spherical energy surface model for metal. This enables the phase transition from metal to semiconductor based on the topology of the energy surface. Hence this is a form of topological phase transition.

The effects of the warping of the energy surface model on the transport phenomena in ultrasonic attenuation was given in the thesis. This can be shown by the difference between the theoretical expressions for the magnetoconductivity tensor and the magnetoresistivity for the case of a warped energy surface for semiconductor and those obtained using a free electron model for metal. The magnetoresistivity obtained by using a warped energy surface model and with a constant relaxation time has terms starting from H and decreasing down to $H^{-\infty}$. The magnetoresistivity obtained by using a free electron model and with a constant relaxation time is a summation of terms from $H^{-\infty}$. And increases up to

H^{∞} . The magnetoconductivity tensor obtained by using a warped energy surface model and with a constant relation time has terms starting from H^{-1} and decreases down to $H^{-\infty}$. In steps of H^2 . The magnetoconductivity tensor obtained by using a free electron model and with a constant relaxation time has

terms starting from $H^{-\infty}$. And increases up to H^{∞} . . So the effect of warping is to decrease the number of terms in the expression of the magnetoresistivity and the magnetoconductivity tensor . In other words, it decreases the dependence of both the magnetoresistivity and magnetoconductivity tensor on the magnetic field strength.

Also it showed the decrease of the magnetoconductivity for semiconductor compared with that of metal which illustrates an intrinsic property of semiconductor as an outcome of the phase transition.

My PhD thesis showed the change of the topology or geometry of the energy surface from a spherical energy surface to a warped energy model giving rise to the phase transition from metal to semiconductor. Hence this is a form of a topological phase transition. This work was completed in 1969 which was three years earlier than that of the Nobel physics prize winning work of Kosterlitz, Thouless and Haldane. This showed my PhD work pioneered the topological phase transition.

References

1.Kosterlitz,J.M. and Thouless,D.J.,Long range order and metastability in two dimensional solids and superfluids(Application of dislocation theory), Journal of Physics C: Solid State Physics, **5(11)**,L124,1972.

2.Haldane,F.D., Continuum dynamics of the 1-D Heisenberg antiferromagnet:Identification with the O(3) nonlinear sigma model, Physics Letters A,**93(9)**,464,1983.

3. Bansil, A., Lim, H., and Das, T., Colloquium: topological band theory, Revision of Modern Physics,

vol.88, no.2, article 021004, 2016.

4. Madelung, O., Introduction to Solid State Theory, vol.2, Springer Science & Business Media, 2012

5. Gan, Woon Siong, Transport Theory in Magnetoacoustics, PhD thesis, University of London, 1969, unpublished..

VI. PRODUCTS ON ACOUSTICS

The following is a new acoustics product from Italy

From: Richard Medallo <Richard.Medallo@rothoblaas.com>

To: WOON SIONG Gan <wsgan@metaultrasound.com>

Cc:

Bcc:

Date: Mon, 27 Sep 2021 13:45:06 +0000

Subject: ACOUSTIC SYSTEM FOR TIMBER BUILDINGS CRM:0340154

Dear Sir/Madame,

I am contacting you on behalf of Rothoblaas Srl., an Italian multinational from the Italian alpine region and a leader in the development and supply of advanced technological solutions for the wood construction sector. The Rothoblaas product offering is made up of:

- Fastening systems and concealed junctions;
- Waterproofing and airtightness solutions;
- Fall-protection systems;
- **SOUNDPROOFING SOLUTIONS**
- Carpentry tools and equipment.

The product offering is supplemented by a vast range of accessories. Furthermore, a set of design and engineering calculation tools are made available free of charge on the <http://www.rothoblaas.com> website. Moreover, a team of highly specialized technicians provides a consulting service in 5 languages and a wide range of training courses for designers, carpenters and installers of fall-protection systems.

Rothoblaas has a sales and marketing organization in 30 countries and 13 international logistics centers with more than 270 collaborators: a continually expanding global network. The know-how matured over 25 years in its sector, the completeness of its product offering and the range of services made available to its customers make Rothoblaas the right partner for whoever needs to design and build with wood.

Today Rothoblaas makes available to its customers the knowledge gained on 5 continents through its technically advanced catalogs and its network of highly skilled agents.

In view of the above, I would ask you kindly for an introductory meeting to explore and assess the possibility of cooperation between our companies.

While thanking you for your attention, I shall be glad to provide any additional information.

Looking forward to your response.

Yours faithfully,

Richard Medallo

Technical Sales Representative

ROTHOBLAAS srl (ITALY)

Singapore + Malaysia + Indonesia + Philippines

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Wer diese Mitteilung irrtümlicherweise erhält ist gebeten uns umgehend zu informieren und anschließend die Mitteilung zu vernichten. Vielen Dank.
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ReplyForward

VII. ACOUSTICAL NEWS

Joint zoom seminar held on 21 September 2021 with the Thailand Acoustics and Vibration Association.

Speaker: Prof Kwanchanok Yimtae

Title of talk: Bridging the Silence with Technology and Possibilities

This joint zoom seminar organised jointly with the Thailand Acoustics and Vibration

Association on 21 September 2021 has been a great success, with 42 participants . Out of which

28 were from Thailand. Compared with the usual number of 20 plus participants

when organised solely by SAS ,this showed joint organisation does work well. This

is the first step of collaboration with acoustical societies from ASEAN countries. We

are looking forward of organising joint seminars/workshops with the Acoustics and

Vibration Associations of Indonesia and Malaysia and even regional conferences.

In this pandemic age, regional collaboration can work better than international

collaboration. **We will be looking forward in forming a regional ASEAN Acoustics**

and Vibration Association compared with the Western Pacific Acoustics Commission.

There is tremendous scope for regional collaboration in acoustics and vibration.

Woon Siong Gan

President

Society of Acoustics(Singapore)

VIII.REPORT ON CONFERENCES

The Regional Conference on Acoustics and Vibration (RECAV) organised by the Society of Acoustics(Singapore)

and the Association of Acoustics and Vibration Indonesia(AAVI) was successfully held in Bali,Indonesia from 27 to 28 Nov 2017. There were 110 presentations from 14 countries with 60% of them from Indonesia. There were also some 18 exhibition booths. This reflected strong local participation and the international nature of the conference.

IX. BID FOR FUTURE INTERNATIONAL CONFERENCES

The Society of Acoustics(Singapore) will be hosting the ICSV28 in Singapore from 24 to 28 July 2022 at the Marina Bay Sands Hotel.

The Society of Acoustics(Singapore) will be bidding for hosting the ICA 2031 in Singapore in 2031.

The Society of Acoustics(Singapore) will bidding for hosting the ISTU 204 in Singapore in 2024.

Government Bodies

www.mom.gov.sg

www.nea.gov.sg

www.lta.gov.sg

Technical and Research Sites

Corporate Sites

www.metaultrasound.com

www.noisecontrols.com

(The Society welcomes interested parties to contribute relevant websites to the above e useful links. For more information, please contact us. Thank you.)



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President:

Woon Siong Gan

E-Newsletter compiled by:

Woon Siong Gan