International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

MAY-JUNE 2013

Welcome to the ICASE May-June 2013 Newsletter !

The ICASE Newsletter is a regularly distributed publication containing current information about topics of interest in the field of science education. The table of contents for this issue is located in the right hand column.

The International Council of Associations for Science Education (ICASE) was established in 1973 to extend and improve science education for chldren and young people throughout the world. Today, ICASE is a vast network of science teacher education associations, institutions, foundations and companies, working together to promote science and technology education around the world. ICASE facilitates communication and cooperation at national, regional, and international levels.

International Council of Associations for Science Education

http://www.icaseonline.net

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Science Education International

For information please visit our Journal web page: http://www.icaseonline.net/seiweb

Contents of Newsletter

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ICASE News

Jack Holbrook, ICASE Projects & Secondary Journal

ICASE News

This is the penultimiate newsletter before the ICASE World Conference to be held in Kuching, Malaysia at the end of September(see list of events). Within the meeting will be the ICASE General Assembly witihn which ICASE (through its President – Ben Akpan) will report on the actvities and develoments within ICASE since the last General Assembly held in 2010. The General Assembly is also the occasion for member organisations to raise issues of interest. Actually not only to raise issues but to also have the opportunity to provide guidelines and make requests (even demands) to the ICASE Executive Committee on how ICASE should operate in the future for the benefit of the member organisations.

Clearly it is important that all member organisations are officially represented at the General Assembly. What does 'officially' mean? In this context it means that the member organisation nominates a specific person to represent the organisation at the General Assembly who is authorised to put forward the point of view of the member organisation and to vote on matters raised. This is very important of course if ICASE is to function as per its constitution.

Alas, it is probably that some member organisations cannot have a representative at the General Assembly. This is not a good situation, but clearly financial consideration are an important factor. The ICASE constitution, however, does allow for proxy representation and votes. Thus any member organisation can nominate anyone on the ICASE Executive Committee (see last pages of this newsletter) or an official representative of another ICASE member organisation to represent their organisation. There is no limit to the number of proxy representations and one person can hold, but obviouly they must represent the wishes of the organisation and comment and vote accordingly.

ICASE does have, and has made these known in previous newsletters, its own vision for the future of ICASE and has its own mission statement and futuure plans. If you have not seen these or wish reminders, please contact the ICASE secretary or president.

ICASE Latin America

The pictures below are from the opening ceremony of the VI bi-annual meeting of the Biology Education, hosted by the Soth Brazil region branch of the Berazilain Association for Biology Education and held in the city of Santo Angelo, Rio Grande do sul State (BRAZIL), 22-24 May 2013. This event by a Brazilian member organisation of ICASE was attended by around 400 delegates including the ICASE Latin American Representative, Christiane Gioppo. This event happens every other year. The previous confereence in 2011 was a comnined event of the Brazilian Association for Biology Education and the IV Latin American ICASE regional conference and had more than 800 participants. The Brazilian Association for Biology Education is very proud to be a member of ICASE and appreciates this opportunity to be recognized and become stronger throug ICASE connections. At least three delegates of the South Region Executive Committee will be in Malaysia for the ICASE World Conference.

ICASE North America

The National Association of Science Teachers (NSTA) meeting took place on 11-14 April 2013 where science educators from around the world met in San Antonio, Texas. Ms. Zheng Haoran, Program Manager from the China Association of Children's Science Instructors (CACSI), and Dr. Teresa Kennedy, ICASE President-Elect, where among many international representatives participating in the 2013 NSTA Global Conversations in Science Education Conference.

ICASE Africa

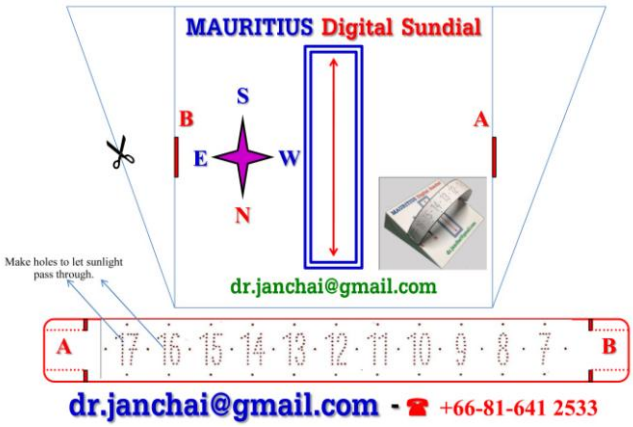
It is with much regret that we announce the passing on of the immediate former Director of the UNESCO Regional Office for Eastern Africa, Prof. Joseph Massaquoi. Prof. Massaquoi retired from the Nairobi Office of UNESCO on 31st October 2012 after 18 years of dedicated service to UNESCO. He passed away on Sunday 26 May 2013 at the Aga Khan Hospital in Nairobi after a short illness. He leaves behind a widow, Mrs. Rachel Massaquoi and three children. He will be interred in his native country of Sierra Leone.

Professor Joseph Massaquoi was a keynote speaker at the ICASE African regional conference, held in Abuja, Nigeria in 2009. His presentation on Peace and Science Education was very well received and ICASE was very pleased to publish this in SEI. You can read his inspirational message in vol 20 issue 1/2, pages 5-24. (see www.icaseonline.net/seiweb).

Dr Janchai Yingprayoon, the chair of that ICASE standing committee on Science and Technology Education Centres was recently invited to give the fifth Rajiv Gandhi Science Centre Memorial Lecture -Title: Mathematics of Planet Earth and to conduct a teacher training workshop for secondary school science teachers in the Mauritius Science Centre. Below he shared a few photos and slides from his presentation.

Janchai (2nd left) wiht chairman and members of the Board of the Centre

A rainbow in Mauritius



A digital sundial designed for Mauritius

. Primary/Pre-secondary Science - Catesian Diver

Emma Wiffen and Steven Sexton

For this edition of the ICASE newsletter, the following primary/pre-secondary activity was written by Emma Wiffen. Emma is currently a second-year student teacher in her initial teacher education programme at the University of Otago in New Zealand. In 2012, Emma completed the compulsory science component of her course which introduced her to the Nature of Science and its importance in relation to the science learning area of the New Zealand primary school curriculum. In 2013 Emma is taking an optional paper in education through science which has its emphasis in how to incorporate science in classroom activities. In this activity, which Emma submitted as part of her course assessments and has given her permission to be used, she demonstrates her understanding of the Nature of Science and how to engage students.

Cartesian Diver

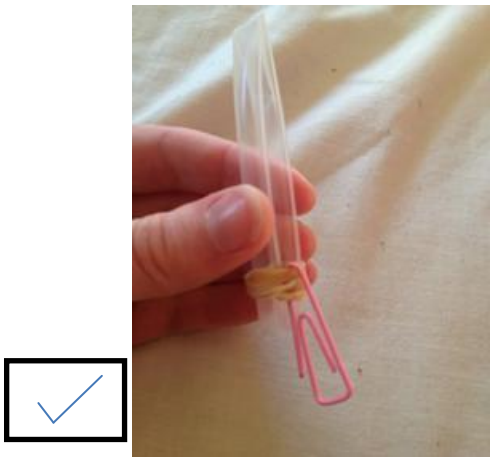
The Cartesian Diver, named after French philosopher René Descartes, has been around for many years and adapted many times during its existence. The version I have made has been constructed out of low cost, recycled material. There are no batteries or electronics in the design. These factors, combined with the ease of construction and excellent content knowledge that can be taught in conjunction with it, make this a very good choice for a toy that can be made and played with in a science classroom.

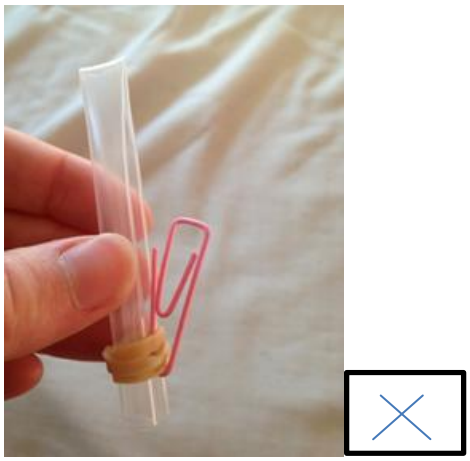
The materials required for this are generally available and easy to access. It only demands small paper clips, one small rubber band, a clear soda bottle with a lid (nothing smaller than 1.5 litres), and a straw (clear is best because it allows you to see exactly what is happening to the 'diver'). Scissors and a ruler are also needed for the construction.

Limited construction difficulty means this toy could be created with children of all ages. Younger children may need help with measuring and cutting their straw, and possibly filling the whole bottle. But everything else should be fairly easy for them to cope with.

I made my Cartesian Diver in less than ten minutes. If you were teaching this to children in a classroom you should manage it in a lesson. Once they have constructed their toy, the science behind it can be discussed. Then you could move on to modifications that could be made and see how successful they may or may not be.

To construct a Cartesian Diver, you first need to measure and cut your straw to about 6 inches or 15 centimetres. Then bend it in half and ensure there is a hard crease where you bent the straw. Once you have bent the straw, wrap a rubber band around it a few times to hold the ends together. With the rubber band attached to the ends of the bent straws, the paperclips are then added as weight. Pull the outside end of the paper clip out and hook it on to the rubber band. Make sure you hook the clips downwards so there is no chance of them falling off.





It is hard to know how many clips will be needed; the best way to find out is trial and error. I used a large jar, placing my diver in and adding more clips until the diver was almost submerged, but not completely. Once you have put on the right amount of clips you can fill your water bottle up. Place the diver in, twist on the cap, and you are ready to go. The final step is to apply force to the bottle to sink the diver, then release to watch it rise again.

The diver, made from a straw, contains an air pocket because it is not fully submerged in the water. When nothing is done to the bottle, the diver floats because its density is lower then that of the water due to the air. However, when the applied force of squeezing the bottle occurs the diver then sinks. This happens because we cannot compress water, it is virtually impossible to compress a liquid or a solid. Air on the other hand, can be compressed.

The water pushes inside the straw, compressing the air bubble. With less air in the straw, it has a heavier density. Gravity then acts on the diver and it sinks. When you release the applied force on the bottle the diver rises back to the top again. The water is no longer compressing the air and the bubble can return to its normal size so it is buoyant again.

There are a number of different reasons for children to play. The types of play involved in the Cartesian Diver are to practice content knowledge and to re-enforce content knowledge. The Cartesian Diver is in the Physical World strand of science for the New Zealand curriculum. This Physical World strand provides explanations for a number of things, including forces and energy. Without forces, this toy would not work at all

The Nature of Science is the overarching strand in science with four achievement aims. Understanding about Science, Investigating in Science, Communication in Science, and Participating and Contributing in Science. Understanding about science is about asking questions about the science. The purpose of these questions is to lead into further exploration and a deeper understanding. Questions that could be asked about this toy and its science are: What would happen if we used something other then water in the bottle; What would happen if we use two different liquids with different densities in the bottle; and Could we then have two divers, one in each liquid. When students ask questions about the science it shows that they are thinking about how the Cartesian Diver works.

Investigating in science often comes after the questions the children have asked about the science. Most of the questions could lead to further activities and constructive play to find out what will happen. Limitations can arise with time constraints; if the class only has a few sessions to work on this particular activity then students may not get to investigate everything they would like to. Another constraint can be materials and costs. Sometimes you just do not have all that is required at your disposal to use. Some materials may be hard to source or too costly to supply for a whole classroom. To mitigate a problem like this, you may be able to get enough material for a few Cartesian Divers that groups could make.

In the Communicating in science strand, children build their vocabulary in order to have a better understanding of the science they are being taught. There are a few important words the children should be able to understand and use when learning about, and discussing the Cartesian Diver. The children should be able to use the terms applied force, density, compression, and buoyancy. The emphasis here is using the vocabulary appropriately to discuss or describe what is happening as they play with their Cartesian Divers.

Participating and contributing is the fourth strand of the Nature of Science. This is where the learning needs to be linked to the children's world and their daily lives. For starters, the children have participated by creating their own Cartesian Diver and discovering how it works. So then we go on to how the science contributes to their world. A real life example of what we have learnt is a human diver. When they are on the surface of the water they float because they are less dense then the water due to the mount of air in their buoyancy compensator. When they release air from it, the weight belt makes their density heavier than the water and they sink. Children will understand that the divers float to being with, without the aide of the weight belt, as they are likely to have had experience swimming. Another example of this for older students is submarines. Submarines use tanks of compressed air to control their density. Both work like the Cartesian Diver and children with an interest in either of things will particularly enjoy learning about the science behind the Cartesian Diver and relating it to human divers and submarines.

Final Comments

Emma has used her emerging understanding of science in the New Zealand curriculum to explain how and why a Cartesian Diver is relevant, useful and meaningful learning for students. In other cultural contexts, the reference to divers and submarines may not be as applicable in how to explain why they activity is able to contribute to students' understanding of science and how it impacts on their world. New Zealand being an island nation is why Emma chose to relate this activity back to a real-world activity many New Zealand students would be familiar with.

Safety Practices for the Science Classroom - The Acceptable Number

James A. Kaufman, Ph.D. Chair, ICASE Committee on Safety in Science Education
International Council for Associations of Science Education

I was thinking the other day about William Lowrence. He wrote the book, *Of Acceptable Risk*. Lowrence said that

"safety is a judgment about the acceptability of risk."

This got me to wondering about what's really acceptable. How many deaths and permanently crippling injuries? How much pain and suffering and property damage?

If the risk is really small, does that make it acceptable? And, if so, to whom? The family that has suffered the loss, the school, the community, society?

If you are a school science teacher, how many children dying in your classroom in a thirty year career is acceptable? How about in your school, in your town, in your state, in our nation? What's acceptable?

In Tulsa, Oklahoma a student was rushed to the hospital to have his thumb reattached after a school science experiment exploded. I'm told that the teacher was grinding a mixture of potassium perchlorate and sulfur in a mortar and pestle. From one account, the teacher was having trouble grinding the mixture so a student was asked to help. Acceptable?

What about at colleges and universities? In one year, there were fires at UC Irvine, UC San Diego, and UC Santa Cruz. Millions of dollars of property damage resulted. Acceptable?

There's no such thing as risk free living. Life is full of hazards. You can't cross the street without taking some risk. How much risk should be acceptable for a school, college, or university science laboratory?

Since 1974, there have been at least dozens of fatalities in school, college, and university science programmes. How do you explain to the parents of a child that was electrocuted that you didn't have a $15.00 ground fault circuit interrupter? Do you tell them it costs too much?

Speaking of acceptable, on a slightly different note, what about repeated violations of EPA hazardous waste violations? How many times does a science department, the principal investigators, post-docs and graduate students need to be warned before they should pay the EPA fine personally?

Imagine that your institution sent you to a professional conference. On the way, you got a speeding ticket. While there you got a parking ticket and your car was towed. When you got back, would you ask the Principal or the Dean to pay the fines? Of course not. **You need to be responsible.**

Zoo Talk

Springer Book

P.G. Patrick, Texas Tech University, Lubbock, TX, USA; S. Dale Tunnicliffe, University of London, England, UK
- Provides a new look at informal education and education in zoosthrough the development of an Informal Learning Model and a Zoo Knowledge Model
- Suggests activities for classroom educators to employ before, during, and after a zoo visit
-First book focusing on how children learn about animals and children's discourse when viewing animals
- Offers a visual explanation of students' knowledge of zoos
- Identifies potential learning opportunities such as narratives, inquiry science, and cross-curricular activities
Founded on the premise that zoos are 'bilingual'—that the zoo, in the shape of its staff and exhibits, and its visitors speak distinct languages—this enlightening analysis of the informal learning that occurs in zoos examines the 'speech' of exhibits and staff as well as the discourse of visitors beginning in the earliest years. Using real-life conversations among visitors as a basis for discussion, the authors interrogate children's responses to the exhibits and by doing so develop an 'informal learning model' and a 'zoo knowledge model' that prompts suggestions for activities that classroom educators can use before, during, and after a zoo visit.

Their analysis of the 'visitor voice' informs creative suggestions for how to enhance the educational experiences of young patrons. By assessing visitors' entry knowledge and their interpretations of the exhibits, the authors establish a baseline for zoos that helps them to refine their communication with visitors, for example in expanding knowledge of issues concerning biodiversity and biological conservation. The book includes practical advice for zoo and classroom educators about positive ways to prepare for zoo visits, engaging activities during visits, and follow-up work that maximizes the pedagogical benefits. It also reflects on the interplay between the developing role of zoos as facilitators of learning, and the ways in which zoos help visitors assimilate the knowledge on offer.
In addition to being essential reading for educators in zoos and in the classroom, this volume is full of insights with much broader contextual relevance for getting the most out of museum visits and field trips in general.

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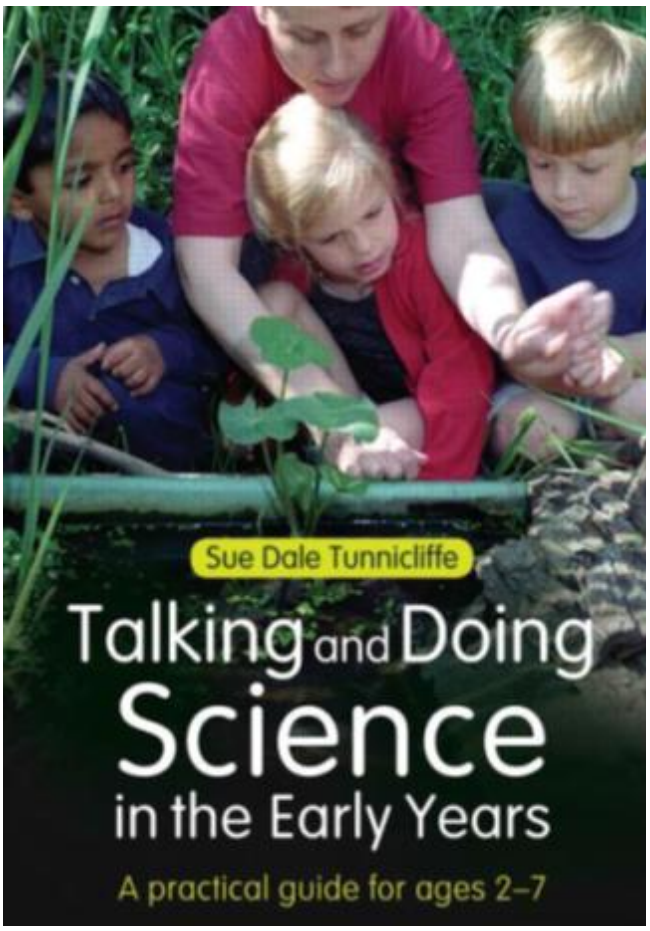
▸ 99,95 € | £90.00 | $129.00 ▸ *106,95 € (D) | 109,95 € (A) | CHF 133.50

Talking and Doing Science in the Early Years (A practical guide for ages 2-7)

By Sue Dale Tunnicliffe



Young children are intuitive, emergent scientists - they observe, raise hypotheses, experiment and notice patterns. Most of our everyday actions at home and in other settings, inside and outside, have a scientific basis and it is through these early experiences that children formulate their ideas about the world in which we live.

This accessible book introduces the simplest form of the principles and the big ideas of science and provides a starting point for encouraging children to have an interest and experiential understanding of basic science and engineering. It shows you how you can support young children in exploring everyday phenomena and develop their scientific language skills through readily available resources and hands-on experiences. Each chapter focuses on a different aspect of science and includes:

- a summary of the 'big ideas' to refresh your own scientific knowledge
- numerous activities that encourage young children to observe, question and carry out their own investigations
- a useful list of everyday resources and relevant vocabulary.

Providing a wealth of exciting, meaningful ways to promote scientific experiences and learning, this highly practical book will help you to build on children's natural curiosity about the world and develop their understanding through your everyday provision in early years settings and at home

Calendar of Events

Sunday 29 September - Thursday 3 October, 2013.

See: http://www.worldste2013.org/

At UNIMAS Sarawak

The University of Malaysia Sarwak campus

The theme of the conference, ***'Live Science, Love Learning, Create Change'***, addresses contemporary issues of importance to Science Teacher Associations, Science Centres, science teacher educators as well as both students and teachers as we move into the second decade after the millennium.

"Live Science" – encourages ICASE member Science Teacher Associations and Science and Technology Education Centres to recognize that science is more than just a subject at school, to impact knowledge and skills adopted from yesterday's approaches. The promotion of science education as interdisciplinary learning is a vital step toward promoting students' acquisition of 21st Century skills not only for sustainable and responsibly citizenship but for a career in an increasing science and technology driven world society.

"Love Learning" – focusses on the role of the teacher, and hence considerations for Science Teacher Associations and Science and Technology Education Centres, not only to guide students to want to participate and acquire the knowledge and skills for tomorrow's society, but that students' own self-motivation is a necessary and key factor in embracing science education as a crucial component of learning.

"Create Change" - deals with the role of Science Teacher Associations, Science and Technology Education Centres as well as teachers themselves in using science education at every level as a way of shifting the mindset on meaningful sustainability, from merely 'talking about' best pedagogical practices to 'undertaking' them, creating a generational change in student attitudes and values towards science and school and the role of leanring through science lessons in shaping their future lives.

IOSTE EURASIAN REGIONAL SYMPOSIUM AND BROKERAGE EVENT HORIZON 2020

October, 30 – November 1, 2013 – Antalya-Turkey

www.ioste2013.org Titanic Beach Resort Hotel, Antalya, Turkey

The International Organization for Science and Technology Education (IOSTE) was established to advance the cause of education in science and technology as a vital part of the general education of the peoples of all countries and to provide scholarly exchange and discussion in the field of science and technology education. Consistent with our mission to encourage the peaceful and ethical use of science and technology in the service of humankind, IOSTE opposes the use of science and technology by government or other organizations for military purposes against civilians. Its origins can be traced to a Symposium on World Trends in Science Education convened in August 1979 in Halifax, Nova Scotia, Canada. At the third symposium, held in Brisbane (Australia) in 1984, the informal circuit of 'World Trends' was transformed into a formal organization with members from over sixty countries.

Today, IOSTE has members from about eighty countries, and is officially recognized by UNESCO as a non-governmental organization. Membership of the International Organization for Science and Technology Education is open to all who subscribe to its Constitution.

We are looking forward to seeing educators, teachers, researchers, and policy makers from around the world at the IOSTE Eurasia Regional Symposium and Brokerage Event Horizon 2020-EU Framework Programme for Research and Innovation, which will be held in Antalya, Turkey. The aim of the brokerage event is to provide information about Horizon 2020 calls for proposals related to science, technology, engineering and mathematics (STEM) education and bring all stakeholders together (universities, research institutions, civil society organisations, SMEs, public bodies, science centres etc.) to promote partnerships among potential coordinators and partners in a fruitful networking environment.

Kind regards,

Bulent Cavas, Dokuz Eylul University, Turkey

Pierre Clement, Université Lyon, France

Gultekin Cakmakci, Hacettepe University, Turkey

IMPORTANT DATES

Abstract Submission Deadline: 16 July, 2013

Abstract Review Announcement: 16 August, 2013

Early Bird Registration Deadline: 18 September, 2013

Conference Dates: 30 October- 1 November, 2013

Universität Bremen

Technische Universität Dortmund

Science Education Research and Education for Sustainable Development (ESD)

22nd Symposium on Chemistry and Science Education
to be held at the University of Bremen, June 19-21, 2014

(First Announcement)
www.chemiedidaktik.uni-bremen.de/symp2014/

Conference dates: June 19 - 21, 2014

Conference language: English
Venue: University of Bremen, Dept. of Biology and Chemistry building, Leobener Str. NW 2, 28334 Bremen, Germany

Conference fees:
None. Travel costs, accommodation and social events are the responsibility of the participants.

Conference chairs:
Prof. Dr. Ingo Eilks, Department of Biology and Chemistry, Institute for Science Education, University of Bremen, Leobener Str. NW 2, D-28334 Bremen, Germany,
ingo.eilks@unibremen.de

Prof. Dr. Bernd Ralle, Department of Chemistry, Didactics of Chemistry I, Dortmund University of Technology, Otto-Hahn-Str.6, D-44227 Dortmund, Germany,
bernd.ralle@unidortmund.de

Further information:
Current information will be published at *www.chemiedidaktik.uni-bremen.de/symp2014/* from January 2013.

A 2nd announcement will follow in Autumn 2013.

ICASE Executive Committee 2011-2013

The ICASE Executive Committee is persons who make decisions on behalf of the ICASE Governing Body. The ICASE Governing Body is the **ICASE member organisations**.

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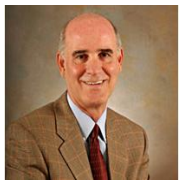

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