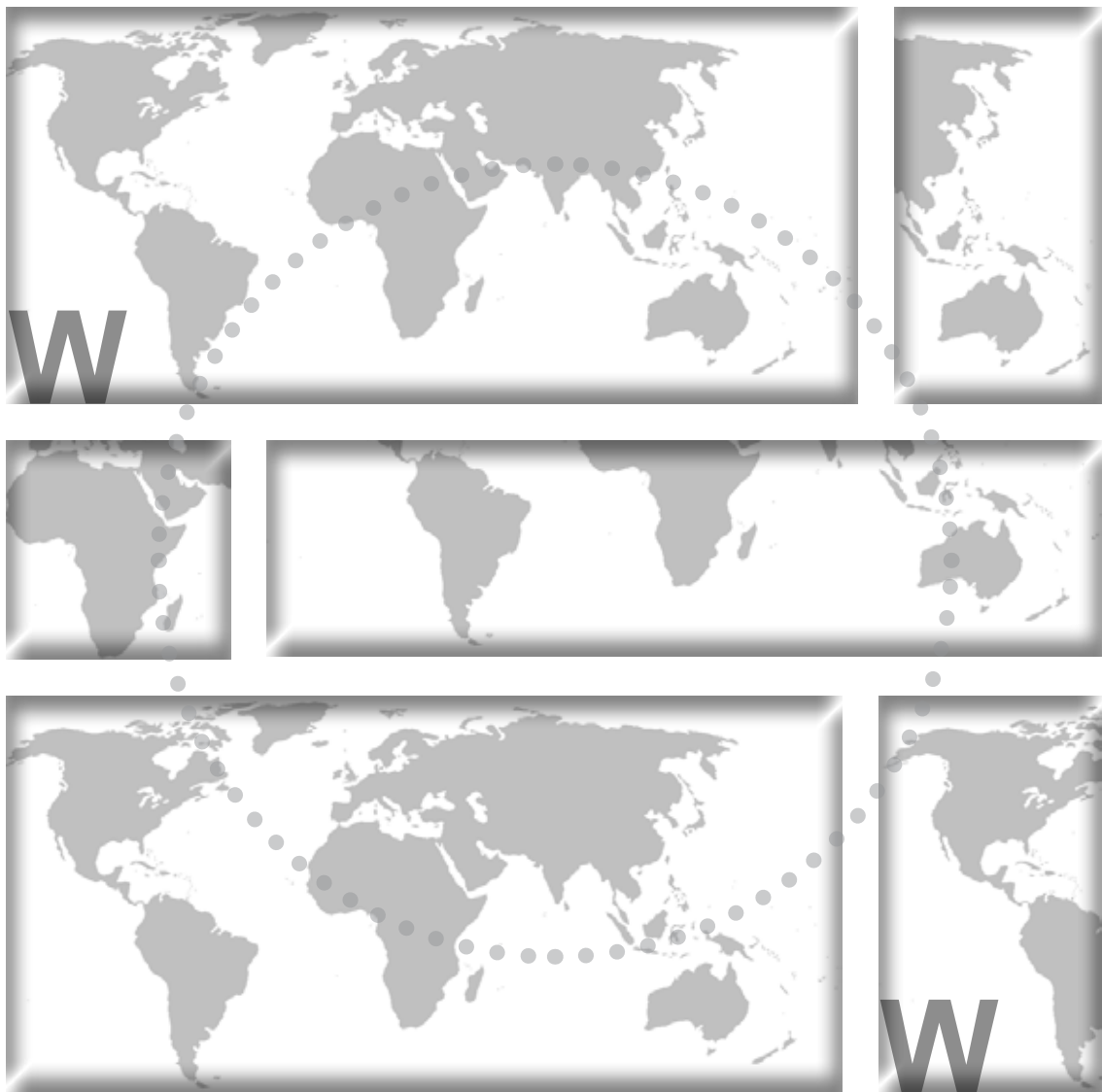


# WISENet

Women in Science Enquiry Network

## WISENet — Joining Worlds



WISENET Journal  
Volume 80  
2009

WISENET National

# WOMEN IN SCIENCE ENQUIRY NETWORK

## Objectives

- (a) To build a supportive and active network of people interested in the objectives of WISENET and to liaise with other interested groups;
- (b) To increase women's participation at all levels in the sciences where they are now underrepresented;
- (c) To provide comment and to examine the education, training and employment structures which currently restrict women's opportunities in the sciences;
- (d) To gather and disseminate data on women in science – the sciences here including the physical, social and life sciences, mathematics, computing, medicine, engineering and associated technologies;
- (e) To explore linkages between the different disciplines and promote communication between scientists and the community on science related social and environmental issues;
- (f) To promote research and technologies for the benefit of communities;
- (g) To explore programs for change in the sciences and support more democratic and participatory systems as an alternative to the traditional models;
- (h) To support appropriate action to achieve these objectives.

Women in Science Enquiry Network (WISENET) Inc was established to increase women's participation in the sciences and to link people in different branches of science and those who are working towards a more participatory and socially useful science.

WISENET was formed through the establishment of a series of link groups throughout Australia. State and regional groups act autonomously, focusing activities primarily at a local level, but also inclusively with other groups for more general or national issues.

WISENET is open to women and men who are involved or interested in the sciences and who are interested in working for change in line with the objectives. New members are welcome. If you would like to join, please visit <http://www.wisenet-australia.org> to download an application form.



c/- Convention Associates, 8 Ewart St, MALVERN VIC 3144

WISENET'S Web Site: <http://www.wisenet-australia.org>

# Editorial

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Avoid sexist or other discriminatory language. WISENET reserves the right to make editorial changes. Each article is the opinion of the author and not necessarily that of WISENET.

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This edition of WISENet brings together different worlds.

Firstly, we bring together the worlds of female scientists: Year 9 schoolgirls from Newcastle, NSW; early-career winner of the *Cosmopolitan Fun, Fearless and Female Women of Science* award, Tu’uhevaha Kaitu’u-Lino; CSIRO’s Cathy Foley – physicist, scientist, wife, mother, manager and scout leader; and we recommend a re-read of Ruth Lechte’s stories now that she is ‘retired?’.

Secondly, we bring together the worlds of science acronyms that pack a punch: UNESCO, PORTIA, EQUALITECH, TWOWS, CSIRO, AGPEST. All extend invitations to WISENet to be involved in science, technology and gender issues. It is up to us to respond. Of note is the upcoming Chinese Academy of Sciences International Conference: “Women Scientists in a Changing World”. Will there be any representation from WISENet?

More involvement – leading to... It is worth heeding the words of Professor Ameenah Gurib-Fakim, a L’ORÉAL–UNESCO laureate who records on the UNESCO website: *like any new population, the influx of women into the profession is slowly but surely changing the face of research. Women are bringing fresh approaches and points of view which can only nurture progress. They are beginning to influence the science agenda, thanks to a growing presence on scientific boards. They are adding value to innovation, not least because they bring ‘insider information’ on the needs and aspirations of the female consumer to the development of products and services.*

We can bring about the changes we seek – it is a case of self belief and staying involved and connected to all the different worlds – and WISENet continues to have an important role.

*Anna Robinson*

# Options Open — Life Changes

Pauline  
Dunne  
&  
Belinda  
Munn

When 180 Year 9 girls enrolled in a unique summer school at the University of Newcastle in late 2007, little did they realise how dramatically their perspective on the rest of their lives was about to change. Practical and theoretical tasks revolving around maths, science, technology and engineering opened the girls' eyes to how these subjects could lead them to rewarding, interesting and highly valuable careers they may otherwise have never considered.

From learning about artificial intelligence and robotics to constructing and demonstrating water towers, the topics and practical experiments were designed to engage and challenge the girls on a variety of levels. When solving problems with quirky names such as Leprechaun Cannon, Wing and a Prayer, ElectraCity, Babe, Back to the Future and Confounding Communications the students engaged with the principles of fibre optics, codes and data transfer, compressed air, power distribution and propeller design; all part of a series of small group activities developed by the University of Newcastle's Science and Engineering Challenge Team.

The Yr9 GIRLS + MATHS + SCIENCE = CHOICES Summer School is an initiative of the University of Newcastle's Equity and Diversity Unit. An annual event, conducted for the first time in

December 2007, it supports the involvement of Year 9 girls with the potential for studying Maths and Science in Years 11 and 12.

Why girls only? As most readers would know, participation rates for females in non-traditional areas of study and employment remain consistently low. Selecting Year 11 and 12 Mathematics and Science subjects at the entry level required for degree programs considered non-traditional for women maintains career options for female school leavers. The Girls Choices Summer School aims to boost confidence in each young woman's ability to achieve in these subjects and to expose them to study and career paths that exist for HSC graduates with Maths and Science.

Funded through the Commonwealth Government's Higher Education Equity Support Program, students are selected from Equity Target Groups such as students from Regional and Rural areas, Low Socio-Economic Status or Non-English Speaking Backgrounds, students with a Disability and Indigenous students – all are encouraged to apply. This is an approach supported by the 2008 Participation and Equity<sup>1</sup> review which states that 'for people living in rural or remote areas and people from low SES ... (there has been) ... virtually no progress ... in improving their participation share ... (in higher education)... despite 15 years of equity policy' (p15).

One student, Tamara Schulz, said the Summer School was one of her best ever



*Triangles, squares, hexagons? Students test the strength of towers made from plastic straws and masking tape.*

<sup>1</sup> Participation and Equity: A review of the participation in higher education of people from low socioeconomic backgrounds and Indigenous people. Prepared by the Centre for the Study of Higher Education University of Melbourne March 2008

and most memorable experiences, and that it had definitely affected her Yr 11 and 12 and career choices. She said she was now aiming to study medical science and biomedical engineering at university – the Summer School had really changed her life.

Student Erin Clarke said the Summer School influenced her subject choices; she has chosen extension maths for her senior years and is also studying engineering studies through open high school. The Summer School had shown her many new possibilities for her future and Erin now has her goals set on a degree in electrical engineering.

Parents have also whole heartedly endorsed the Summer School. One parent wrote, 'I can only describe ... (the Summer School) ... as an opportunity of a lifetime ... (my daughter) ... had a blast, she met girls her own age who were like minded!!!!!! She is keen to learn so much more'. Another describes how her daughter, '... is now talking about Uni. It is not so scary or hard to reach. Coming from a small rural isolated school these opportunities don't come at all'. And finally, 'it gave ideas and inspiration. As a result ... (my daughter) ... is studying science subjects for her HSC'.

The Summer School is strongly supported by the Deputy Vic-Chancellor (Academic), Professor Kevin McConkey,



*Newcastle City Council Surveyors take the girls through the basics.*



*The Science and Engineering Challenge Finale. Students put their barriers to the test.*

who believes that it is all about creating choices and providing a link between-maths, science and fulfilling careers. 'It shows how this course of study can open up pathways to a whole range of exciting and inspirational careers that are vital to society'.

The program includes career talks given by women in non-traditional roles, interactive activities and industry site visits to motivate and inspire the students to consider carefully their subject choices for Years 11 and 12. The Girls Choices Summer School aims to boost confidence, provide encouragement and put forward role models for those students who are generally less likely to attend university because of a limited vision of the choices available.

As well as providing academic insights, the Summer School gives the girls the opportunity to stay in University residences and to taste University and city life in a secure and caring environment, an especially important experience for students from remote regions. In addition, increasing the level of expected academic achievement is important for students from small communities. Teachers have commented that students return with a more realistic understanding of the 'competition that's out there' and have been motivated to achieve their personal best — not just get by.

A full evening program of sport, swimming, art and dance allows the girls to burn off excess energy and a chance to socialise and form lasting friendships. One often heard expression through the week is how wonderful it is to be with girls who think maths and science are really interesting - many students have continued to correspond and share experiences.

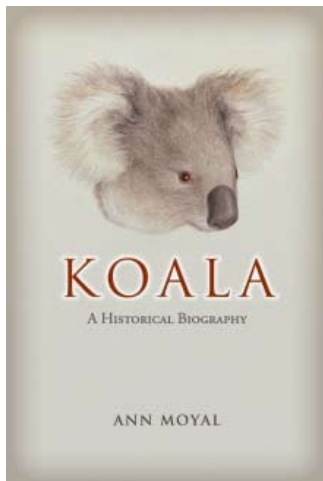
A more rigorous assessment of the Summer School's impact on student choices is being undertaken. Follow-up surveys are planned with students from each year's cohort; subject choices and career plans are to be surveyed in Yr 10, 11 and 12. The views of teachers and parents will also be canvassed to provide a more complete picture of the Summer School's influence on the girls' choices for the future. ❖

*Photographs in this article are provided by the authors for inclusion in the WISENET Journal.*

**For more information about the Girls Choices Summer School visit our website at :**

<http://www.newcastle.edu.au/girls-maths-science-summer-school/>

**Author Bio:** The Equity and Diversity Unit Summer School Management Team is Pauline Dunne, Student Equity Officer and Belinda Munn, Manager Equity and Diversity. Pauline has a background in Adult Education, primarily English Language Teaching and Teacher Training, and has worked on various Community Development programs both in Australia and overseas. Belinda has worked in a range of community development and training roles in a variety of government and community organisations including the NSW Anti-Discrimination Board and AIDS Council of NSW. An ongoing objective of the Equity and Diversity Unit is to work towards raising the profile and presence of women in non-traditional areas of study at the tertiary level.



## **Congratulations to Ann Moyal .....**

on publication of her new book *KOALA, A HISTORICAL BIOGRAPHY*. Ann has been a WISENet member since its inception and memorably promotes Australian science and the work of Australian scientists. Beautifully written and illustrated, this book imparts rare knowledge and insights about our unusual Australian Koala. The publication adds to Ann's world-wide reputation as a Science Historian. This publication also represents a significant addition to our Australian literature, following on from the very successful *PLATYPUS* which went through many reprints and was translated into other languages. *PLATYPUS* became a reference for scientists and naturalists and is even more so now that the platypus genome has been sequenced (Nature 453, 175-183 - 8 May 2008).



*Ann Moyal receiving the Doctor of Letters at Sydney University  
Photograph courtesy Ann Moyal*

## Cathy Foley: *I'm a wife, I'm a mother, I am a scientist, I'm a manager, I'm a scout leader...*



Dr Cathy Foley is a Chief Research Scientist with CSIRO Materials Science and Engineering. She has a world-class reputation in her field being a Fellow of the Institute of Physics in the UK, Immediate past President of the Australian Institute of Physics and Fellow of the Academy of Technological Sciences and Engineering (ASTE). Cathy is well known for her interests in physics, science education, women in science (*Cathy is a WISNET member*), and science in the media. She was a regular weekly guest on ABC radio 2BL for 5 years. Cathy was awarded a Public Service Medal on the 2003 Australia Day; won the 2003 Eureka Prize for the promotion of Science; and was most recently awarded the 2009 National Telstra Business Women of the Year for Innovation.

However, Cathy is also lots of other things. She was featured in the WISNET Journal 56 (2001) and describes her work in superconductors in detail there. Still engaged, here is an extract from an interview with Cathy when she appeared on CATALYST, an ABC Science Program in 2008.

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I have a lot of different hats! I guess first of all I'm a wife, I'm a mother, I am a scientist, I'm a manager, I'm a scout leader... It's a busy life.

I don't come from a traditional science background family wise. I'm one of seven children, I was dyslexic, and when I was in primary school my spelling and handwriting were atrocious. When I was in high school, the teacher who inspired me picked up the fact I was strong at science because I was so weak in other subjects. **I think science teachers are probably the most important people in making and encouraging any young child to consider science as a career.** And I've always had this passion for science. I wanted to be a science teacher because I didn't dream of being a scientist. I always thought you had to be sort of Einstein's relative if you were going to be a physicist. But I still had that secret desire.

I've been working at CSIRO for nearly 23 years and I couldn't dream of working anywhere else. I've always thought I won the lottery when I got the job here. Most recently I've been working in superconductivity as my main research field. A superconductor is just a material that has some special properties which are observable only when you cool it below a certain temperature which can allow electricity to pass through without any resistance. If you get two superconducting electrodes and try to pass current between one and the other, if you bring them closer and closer together an electrical current will tunnel from one side to the other and that tunnelling current allows us to detect very small magnetic fields. Our most successful application of our superconducting devices has been in mineral exploration. What we've been doing is making a device and filling it up with liquid nitrogen which is at minus two hundred degrees. We're able to take this out into the field to do measurements looking for minerals deep under the earth's crust.

I had the most wonderful recognition by the Australian science physics community by my election to President of the Australian Institute of Physics. **Being the first woman in this role** has been very exciting and given me an opportunity to project my passion for physics in a whole range of different ways which I really enjoy.

My motivation for being a Joey leader (Scouts) is to connect with the community and being able to inject a lot of science is I guess a secondary issue. I just love their spontaneity [of the scouts]. It's so engaging and so relaxing and so different from anything else I do. I guess it's my '*me time*', where I go and do something which gives me a recharge every week.

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*So children and a career in science DO go together... lovely. Thanks Cathy, Ed.*

# Does Physics need Diversity?

Cathy  
Foley

A quick review of physics journal articles indicates that the single-authored paper is becoming uncommon. In fact studies on the authorship of science journal articles have shown that multiple authored papers attract more citations and are usually of higher quality [1]. This also reflects the movement over the last few generations of physics research being performed by teams rather than by individuals. Furthermore these teams are getting larger and more complex with the surge of multiorganisational research programs such as CRCs, Centres of Excellence and CSIRO Flagships which are important components of the Australian innovation process. Research over the years has moved away from an expectation that, when a researcher undertakes a project, the project was considered complete when the scientific journal article was written and published. Science research teams are now required to deliver a level of impact with the expectation that an idea or concept is experimentally proven and then commercialised or implemented.

Even though the expectations of research programs have broadened, we still tend to expect all scientists to demonstrate a single approach to their research. We expect that research teams will form naturally to achieve the task at hand. However with our society wanting excellent science as determined by science metrics while undertaking research that has impact for commercialization and public benefit, we have not given much thought to the more detailed attributes needed by scientists to achieve the various stages of the innovation process from idea to product or solution. What are the best teams that are needed to achieve these multi-faceted requirements? Should all research scientists be the same?

Let's look at the individual scientist and their contribution. Over the years I have come to understand that there are three

stages of a science project which require three different approaches for the project goal to be achieved. A science project is initiated to solve a problem or to test a hypothesis or idea. It is in this early stage that the creative thinkers are in their element. They are often the scientists who come up with more ideas than many of us could ever consider. These creative scientists provide the ideas and directions that great science projects use as the basis for their research. Unfortunately these scientists are working at their best creating new ideas and usually find it quite difficult to follow through beyond the initial experiments or theory before they are coming up with their next great idea. These ideas come at such a rate, they often feel they have no time to write up their work for publication and consequently have poor publication records and can feel that their input goes unacknowledged or unrecognised. They can become increasingly protective of their ideas to the point where it could become an impediment for their career development.

The second type of scientist is the one who methodically takes the terrific idea and makes it into solid science by undertaking more detailed theory and modelling development or experiments. They are usually not great ideas people but are very effective at transforming the initial creative idea into a successful research effort. They are usually good at writing up their work and have lots of publications (hopefully with their creative colleague as a co-author). They usually find that they have all the attributes that make promotion in the science system easier for them as their output is of a more traditional nature that can be measured for scientific success.

The third type of scientist is the entrepreneur who can see the benefits of the creative idea progressed to solid science. They can see where an idea can be used and can design applications and develop

prototypes or opportunities to capitalise on the creative idea that has been solidly researched and is now ready to transition to an application. This type of scientist is not that common but is increasingly needed to help research projects achieve the impact expected by our stakeholders (community, research organisations, industry and government).

Each of these scientific roles is necessary to achieve all the components expected of a successful science project to achieve the transition of an idea to impact and yet we are often expecting the same person to do all three roles. Recognising this diverse approach to the science process should make a difference in project effectiveness and the needed respect between scientists who play the different roles but who often hold their colleagues in contempt.

Another important requirement of successful and effective research teams is the need for a balance in the constitution of the personality types that make up the team. There are several different ways to study the different personality types such as the Team Management Index [2]. This index shows the need for a balance in the group roles from creative/innovators, explorer/promoters, thruster/organisers, inspector/controllers, upholder/maintainers, reporter/adviser and concluder/finishers. People have a natural preference to adopt one of these roles in their major work style and display two other roles with less dominance. For example, I am a dominantly a creative/innovator but with explorer/promoter and reporter/adviser secondary preferences. However my role at work has required me develop concluder/finisher and thruster/organiser behaviours.

This method of analysing a team has found that a successful team requires its different team members to demonstrate the range of roles with different people assuming roles based on their work preference. For example, a team of only concluder/finishers will get all the work done but usually not have many new ideas

and a team of creative/innovators have lots of ideas but never finish anything. The method of analysis can also help team leaders manage their teams effectively by preventing frustration resulting from a team member being required to undertake a role or responsibility that is completely outside their natural work preference. Understanding these work preferences can help teams to be more effective and also develop a respect for the different and crucial role each member plays in the team.

Research into cross functional teams needed to solve complex problems has been the subject of research in management and psychology theory [3]. This research has identified three characteristics of productive teams that are strongly related to individual differences that appear to dominate: effective leadership, intra-team communication, and group cohesion. However a fourth characteristic has been more recently identified: that of heterogeneity or diversity.

These four dominant individual different characteristics of productive teams can form an evaluative model of the impact of personality type on team performance. That is, diversity in skills and knowledge combined with a balance of personality types is desirable for effective teams. The Myers-Briggs Type Indicator (MBTI) [4], which is based on Jungian psychological type theory, is one proposed framework that can be used to discuss personality types and their potential influence on team effectiveness:

- How a person is energised – designated by extrovert (E) versus introvert (I),
- What information a person perceives – designated by sensing (S) versus intuition (N),
- How a person decides – thinking (T) versus feeling (F), and
- The life-style a person adopts – judging (J) versus perceiving (P).

Details of these personality types are given in references [4-5]. According to personality type theory, individuals are predisposed to one of each of these four preference alternatives in their behaviour. Myers [6] and Kroeger and Thuesen [7] suggest that presence of diversity of these psychological types in a team results in greater successful group performance. They suggest that a diverse team may take longer to accomplish a project, but the end result will always be better. Some examples of how opposing types help the group process are as follows: extroverts (Es) help open up lines of communication between group members, while introverts (Is) provide internal reflection of group discussions. Sensing (S) types bring up pertinent facts and “what is”, while intuitive (Ns) types bring up new possibilities and provide ideas of “what might be”. Thinking (Ts) types present a logical analysis of the decision-making situation, while feelers (Fs) offer insights into how feelings of other group members and customers might affect the situation. Judgers (Js) help keep the team on schedule, while perceivers (P) help the team consider other alternatives in the decision-making process.

It is interesting to note that an article in the *Australian Physicist* some years ago reported on personality type and careers in physics [8] and indicated that physicists were disproportionately INTJs, one of the 16 combinations of the different personality profiles. (Note that at my work place, we have about 30% INTJ personality types compared to the wider population of 5%.) Physics may benefit from encouraging more diversity in the project team composition.

As it is often easier to work with like-minded people, we naturally tend to create research teams with them. It may be that we would do better to analyse our research team composition to see if we do have diversity and consider ways to improve team diversity if it is lacking. Note that gender difference is an easy way to help increase the diversity of a team. For example, in Australia, women tend to be more often extroverted than men.

So in this era of undertaking science research in teams, we need to consider the team composition and when vacancies arise identify the type of scientist we need (creative ideas scientist, solid researcher that takes the work through the rigor of the scientific process and the entrepreneur who creates the research impact), the personality or team role we need to fill to assist our team to achieve the highest impact both in science quality and community benefit. But most importantly as a professionals and decent human beings, we should be respectful of the differences in the way our colleagues prefer to work and to recognise their value and contribution. ❖

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# Women's business reveals path to scar-free healing

From  
Nial  
Byrne  
&  
Sarah  
Brooker

Fresh Scientist Tu'uhevaha Kaitu'u-Lino has won the 2009 Cosmopolitan Fun, Fearless, Female, Women of Science – and a \$10,000 cheque. She rose over celebrities, athletes, writers, designers and others in the reader-voted competition (<http://freshscience.org.au/>). The following is her story.

Healing without scars and more effective therapy for women with period problems — those are possibilities raised by the research of Tu'uhevaha Kaitu'u-

Lino (Tu'hu for short, pronounced Tu hay) at Prince Henry's Institute and Monash University. She has identified the key cells in the immune

system important for restoration of the lining of the uterus after menstruation. "Up to one in 10 Australian women suffer from problems with their monthly period," Kaitu'u says. "Heavy, prolonged or unusually frequent vaginal bleeding affects women's quality of life and is a leading reason they seek medical advice. In addition, understanding the unique ability of the uterus to heal without scarring could be applied to helping burns victims and improving cosmetic procedures," says Kaitu'u.

Treating menstrual bleeding problems requires a better knowledge of normal menstruation, when the endometrium or uterus lining disintegrates each month and then heals. "Inadequate endometrial healing could result in the abnormal bleeding some women experience," Kaitu'u says.

But there's a real difficulty with studying the process at this level. Of all animals, only women and a few species of monkey menstruate. Neither group can easily be used for experimental work. So, for their studies, the researchers found a way to induce menstruation in mice. "The mouse model allows us to closely examine the mechanisms of menstruation; impossible in humans," said Lois Salamonsen, director of the Uterine Biology Group at Prince Henry's.

Using the menstruating mice, Kaitu'u discovered that a major group of immune system cells better known for fighting infection is involved in endometrial healing — the white blood cells known as neutrophils. They begin to appear within the endometrium as soon as menstruation starts. Kaitu'u eliminated neutrophils from the mice using a chemical which tells the body to destroy them. This treatment delayed repair of the uterine lining in more than half her animals. Discovering the importance of neutrophils in uterine healing provides new insights into the body's repair mechanisms. The work was considered so important, it was published earlier this year in the renowned medical research journal *Cell and Tissue Research*.

Tu'uhevaha Kaitu'u-Lino is one of 16 early-career scientists who presented their research to the public for the first time thanks to Fresh Science, a national program sponsored by the Federal and Victorian Governments. ❖

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*Tu'uhevaha Kaitu'u-Lino examining research*

*Photograph: Greg Ford and Melissa Di Ciero, photographic unit, Monash University*

# Revisiting the UNESCO Science Technology and Gender Report

Anna  
Robinson

Website: [http://www.unesco.org/science/psd/focus/focus07/gender\\_rep.shtml](http://www.unesco.org/science/psd/focus/focus07/gender_rep.shtml)

WISNET was invited to participate in writing the UNESCO Science, Technology and Gender Report. This was released in 2007 and WISNET is included in the list of authors. It was disappointing that so few WISNET members became involved. It was such an important report – and, for me, the work was valuable and very worthwhile. Invitations were extended to WISNET to attend the Paris meetings twice – but no-one accepted. We joined one meeting by telephone conference but only two members attended from WISNET. The information in the report is a powerful reminder of why we do science; more importantly, the information makes such sense of WISNET's aims and objectives. The Report is continuous and participation is welcome. It may be a way for WISNET to stay connected to the global debate on Science Technology and Gender and may provide opportunities for members to connect to UNESCO. The following is a brief review.

**Summary:** The report found that 'gender discrimination practices truly limit the ability of many developing countries to grow and reduce poverty'. 'Much talent is being wasted as girls turn away from S&T careers and as women in S&T become discouraged by discriminatory treatment.' The report also notes that 'differences between girls and boys in performance at school are more linked to home and school environments than dependent on innate differences.' It is thus hardly surprising that 'women scientists are more likely than their male counterparts to have at least one parent who is a scientist.' Science, Technology and Gender has been coordinated by UNESCO's Division for Science Policy and Sustainable Development. Based on empirical research and

data, the report incorporates substantive input from institutions involved in science and technology (S&T), gender studies and policy – including WISNET. Marking the start of an ongoing initiative, it aims to spur serious discussion and action in national and international scientific and academic communities, in order to increase women's participation in S&T careers, enable sex-disaggregated data collection and rigorous research development, and build public awareness of gender issues. The report has been published initially in English but versions in Arabic, Chinese, Spanish and Russian have now been completed. ❖

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Ernesto Fernández Polcuch, programme specialist for science and technology at the UNESCO Institute for Statistics (Montreal, Canada) presented the most relevant findings of the Report.

## What does this Report bring to light?

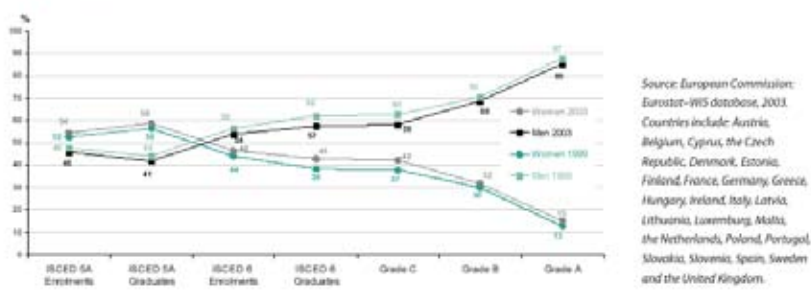
This Report presents the results of the first serious statistical survey on the relation between science, technology and gender at a global level. It allows us to come to various conclusions. First, the participation of women in science at the higher levels of education has increased in the past ten years in most regions of the world. However, once they have finished their studies, only 25% of researchers in science and technology are women and 75% men.

Second, findings vary from one region to another. Whereas Central Asia and, in general, the post-Soviet countries have good gender parity, as do many countries in Latin America, the same cannot be said of Africa and the rest of Asia. It is also clear that in the major part of Europe, above all in Western Europe, research is still predominantly male.



Figure 2.1: Proportions of men and women in various stages of a typical academic career

Figure 2.1a: EU-25, 1999 and 2003



### How can this be explained?

There are different reasons. In the case of Western Europe, for example, many researchers work for industry, where the percentage of women is low. Therefore, the European Union has pinpointed this as a specific problem.

### But isn't the desertion of science a general problem, without distinction of gender?

It is true that science attracts fewer students, but this is a trend and not yet reflected in the total number of researchers. At the university level, gender parity is much better than at the research level. Percentage wise, there are more women science students than researchers. After their studies, women change directions. In terms of statistics this is reflected in a "scissor diagram" (see extracted Figure 2.1): worldwide, the number of women decreases at the higher levels of scientific research. In certain countries, in the field of science, very few women are heads of department or academics, whereas there are more female than male graduates.

### Are there differences with respect to salaries?

The data we have are not reliable enough to assert this. In general, when countries have strong public structures in the field of research, salary differences due to gender hardly occur, but this is not the case with industrial research. What we can say, is that working conditions in scientific research do

not attract women. There are two reasons: problems of discrimination and problems with work organization: the work days do not accommodate family life.

### Why do certain countries have good results?

Results have to be read with caution, because the data are general and don't reflect different levels. For example, Argentina has a parity of 50%, but in the higher levels of scientific careers women are under-represented. The researcher's status in society also enters into consideration: in certain countries, it is prestigious to be a researcher, whereas in others, above all in less developed countries, the profession is less well perceived. This is also related to salary levels. In countries where salaries of researchers are very low, the profession tends to be the second profession in the family, not the main breadwinner's. When this is the case, it progressively becomes a female profession, without being the consequence of true parity and equal opportunity.

### Which fields display the greatest disparities between men and women?

In the field of engineering, there are few women. However in biology and medicine, there are as many women as men, if not more. In the computer sciences also there are more men...the information society is still a society of men.

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The following correspondence relates to the report (see the next page).

(a) Letter from Eduardo Martinez Garcia, the Technical Coordinator of the Report explaining the background and ongoing information. Please do contact him if you wish to become involved or obtain more information.

(b) Letter from EQUALITECH, a European company with some very valuable and practical reports.

## (a) Letter from Eduardo Martinez Garcia

the Technical Coordinator of the Technology and Gender Report explaining the background and ongoing information.



Science Policy & Sustainable Development Division  
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Paris, 20 November 2007

Ms Anna Robinson  
National Convenor,  
WISENET-Women in Science Enquiry Network  
c/-Convention Associates  
13 Jeffrey Street  
Mt. Waverly VIC 3149  
Australia

Dear Dr Robinson,

For over thirty years now, the United Nations General Assembly and the UN Economic and Social Commission have emphasized inequalities and disparities in the educational opportunities open to women and girls, and in women's access to training and the labour market. Since the 1976–85 United Nations Decade for Women: Equality, Development and Peace, which directed particular attention at the role of women in science and technology, the call for action related to science, technology and gender has steadily intensified. In 2000 gender equality became one of the eight United Nations Millennium Development Goals.

The present Science, Technology and Gender: an International Report has been prepared with the active partnership of specialists in areas relating to science, technology and gender from numerous institutions worldwide, under the technical coordination of UNESCO's Division for Science Policy and Sustainable Development. We highly appreciate the valuable efforts and contributions of these specialists and firmly believe that the present Report is a solid step towards the political and institutional mainstreaming of the gender dimension in science and technology activities.

The Report objectives were:

- a. Produce a solid and rigorous report based on empirical research and data. The Report aims at being both a conceptual and analytical tool, and a framework for action
- b. Provide S&T policy-makers with a Framework for Action regarding gender, S&T at a national and regional levels
- c. Elaborate a sound message and document addressed to national and international scientific and academic communities, promoting the dissemination and serious discussion of gender, S&T issues

Executive summaries of the Report have already been published in the six official languages of United Nations, i.e. Arabic, Chinese, English, French, Russian and Spanish. And it is expected that the full Report will also be published in those languages.

Both a conceptual and analytical tool and a framework for action for policy-makers with regard to science, technology and gender (STG) strategies at national, regional and international levels, this report seeks to promote serious discussion of gender within national and international scientific and academic communities.

**The report is a dynamic document that will be constantly evolving, reviewed and updated. By its very nature, this report is a work in progress; we envision it as constantly evolving,**

**based on the periodical updating and the collective input of specialists from science, technology and gender-related institutions worldwide.**

A suitable framework has yet to be developed that takes account of the most urgent future research areas needed in STG. These include identifying the missing links, data gaps, key issues and critical shortcomings to be addressed in the near future (whenever possible, formulate project profiles). The main focus of the Report is on natural sciences, engineering, and technology. It is expected that, as the Report evolves and it is updated, future version would hopefully cover wider fields of science and technology, such as social sciences, medicine, and agriculture.

The road ahead: Fourteen Major Social Actors have been identified to actively participate in the dissemination, debate, implementation, monitoring and evaluation of the Key Issues and Policy Recommendations of IRSTG Report: (1) National, regional and local governments (ministries/national councils of science and technology /R&D, ministries of education, of labour); (2). Parliaments; (3) STG Coordinating networks, committees, and gender national bodies; (4) Higher education institutions and faculties of science and engineering; (5) R&D centres; (6) Scientific associations, societies and academies; (7) United Nations agencies; (8) International and regional inter-governmental organizations; (9) International, regional and sub-regional development banks; (10) Multilateral and bilateral development-assistance organizations; (11) Non-governmental organizations (NGOs); (12) Foundations; (13) Major companies, private and public; (14) The media.

National and regional forums need to be organized to present, debate, disseminate and follow-up on the IRSTG Report. Regional forums could be organized in: Latin America and the Caribbean, Africa, Arab region, Central Asia, South-East Asia, India, China, Oceania, Eastern Europe. National and regional training seminar-workshops need also to be organized to analyze and discuss the key issues and policy recommendations of the IRSTG Report.

Additionally, please find below the links towards the "Science, Technology and Gender: an International Report" - IRSTG Executive Summary (in PDF format), in the six official U.N. languages:

[www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-English.pdf](http://www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-English.pdf)

[www.unesco.org/science/psd/download/IRSTG-Resume-Francais.pdf](http://www.unesco.org/science/psd/download/IRSTG-Resume-Francais.pdf)

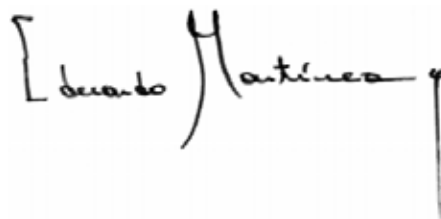
[www.unesco.org/science/psd/download/IRSTG-Resumen-Espanol.pdf](http://www.unesco.org/science/psd/download/IRSTG-Resumen-Espanol.pdf)

[www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-Russian.pdf](http://www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-Russian.pdf)

[www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-Chinese.pdf](http://www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-Chinese.pdf)

[www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-Arabic.pdf](http://www.unesco.org/science/psd/download/IRSTG-ExecutiveSummary-Arabic.pdf)

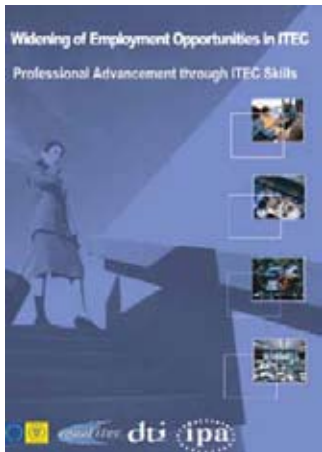
Looking forward to hearing from you.  
All the best,



Eduardo Martinez

## (b) Letter from EQUALITECH

a European company with some very valuable and practical reports.



Dear Dr Robinson

I am writing to introduce Equalitec, a subsidiary of Portia (<http://www.portiaweb.org.uk/>). Equalitec seeks to promote technology related employment and promote equal representation in Information Technology, Electronics and Communications (ITEC) and related industries. Up to now we have had a particular focus on women returning to work after a career break, but our target audience is expanding to include all underrepresented groups in ITEC related industries.

Our work has included working with individual women to researching the barriers that women face in engaging in and progressing within ITEC. I attach a soft copy of our report, "Career Opportunities After Career Breaks", for your interest. Guidance materials such as "Widening of Employment Opportunities in ITEC", are an example of the work that we do directly for women, I also attach a copy of this report. Our seven research reports/guides are available for download at our website, [www.equalitec.org.uk](http://www.equalitec.org.uk).

I read with interest "Science, Technology and Gender: An International Report" and noted your involvement in this important issue. I very much hope that the work of Equalitec will be of interest and perhaps use to you.

Please do not hesitate to contact me for any further information or if I can assist you in our common cause.

Kind regards

Henrietta

**Henrietta Dale**

**Project Coordinator**  
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[henrietta.dale@equalitec.org.uk](mailto:henrietta.dale@equalitec.org.uk)  
[www.equalitec.org.uk](http://www.equalitec.org.uk)

Are you or do you know a women who has created an ITEC innovation or used ITEC in an innovative way? Nominations are now open for the ITEC Innovation Awards 2008, email [awards@equalitec.org.uk](mailto:awards@equalitec.org.uk)

# A Note from Ruth Lechte

## Women Scientists in a Changing World — 27-30 June 2010, Beijing

The papers have come for the Third World Organisation for Women in Science (TWOWS) fourth assembly June 2010 in Beijing.

You may remember that I was one of the keynote speakers at the women in science meeting in 2002 on the work of TWOWS and their recent events and projects at that time.

After living in the Pacific for 40 years I am now retired in Coolum and do not have much to offer by participation in the 4th assembly. However, WISENet members will be interested.

Information about TWOWS can be found at: <http://twows.ictp.it/>

The Beijing Assembly information is as follows:

At the generous invitation of the **Chinese Academy of Sciences (CAS)** the Third World Organization for Women in Science (TWOWS) is pleased to announce that the TWOWS Fourth General Assembly and International Conference will take place at the Beijing International Convention Center (BICC), Beijing, China, 27-30 June 2010.

The **International Conference on “Women Scientists in a Changing World”** is expected to cover a critical range of socially relevant scientific topics of interest to the overall objectives of TWOWS.

The aims of the Conference are to:

- Explore and identify new dimensions for women’s research in science and technology, education and training;

- Identify ways of promoting the involvement of women in harnessing science and technology for sustainable development;
- Explore opportunities and develop strategies for the participation of women in the development and utilization of new technologies;
- Examine the role and develop strategies for the participation and leadership of women in national innovation systems; and
- Explore gender dimensions and effects of scientific and technological research for development.

The aims of the TWOWS Fourth General Assembly are to:

- Determine the future guiding principles and strategies of the Organization;
- Discuss and approve the Organization’s programmes for the period 2010-2014; and
- Elect a new Executive Board for TWOWS to serve during the period 2010-2014.

The general outcomes of the Conference and General Assembly are to:

- Increase recognition of the scientific and technological achievements of women and their contribution to emerging areas of importance in development;
- Increase interaction and promote networking and exchange between women scientists, including young women scientists, from developing countries;
- Increase assistance to national, regional and international organizations to involve women scientists in their projects;

- Disseminate information about TWOWS activities; and
- Increase understanding of the role of science and technology in supporting women's critical role in sustainable development.

Invitation to the Conference and General Assembly is extended to all members of TWOWS and to representatives of international organizations and personalities involved in promoting the role of women in science-based development in the South. **Participation in the event is by invitation only.**

Leading scientists from developing countries will be invited to present keynote papers, followed by workshops with papers and discussions on the scientific contribution of women to these critical areas. Eminent women scientists from the South will present their research work, stressing policy issues pertaining to the participation of women in science and technology in their countries. ❖

## About Ruth...

### Readers may be interested in re-reading about Ruth.

In **WISENet Journal 68**, Ruth writes about being a caretaker in Nairana national Park, Queensland. Ruth and Diane Goodwillie provided some spectacular photographs of the area – and have made them available to WISENet readers. They also welcome volunteers to benefit from giving some time in the remarkable habitat.

In **WISENet Journal 62**, Ruth also writes about her time in Fiji – the base from which she spent her professional life as a field worker in developing countries. Ruth was the Fiji Team Leader of APGEST, Asia-Pacific Gender Equity in Science & Technology, a program spearheaded by UNESCO. The first stage of APGEST has focused on assessment of resources, best practices and gaps in gender science and technology in the Asia-Pacific region. Ruth was also a Board member of the traditional healers' collective WAINA-MATE, which has strong activism in biodiversity retention and WIPPAC, Women in Politics in the Pacific.



*Photograph by  
Ruth Lechte and  
Diane Goodwillie:  
blue winged  
kookaburras  
from our  
Australian world*

# Membership Application / Renewal Form



## APPLICATION FOR MEMBERSHIP / RENEWAL

Women in Science Enquiry Network, Inc. (ABN 56 210 013 744)

**Annual Membership fee (for calendar year, including WISENET Journal) Please tick the appropriate box**

Individual \$50   
  Student \$20   
  Retired Member \$20   
  Group or institution: \$200   
 Donation: \$ . . . . .  
 Total Payment: \$ . . . . .

Payment can be made	Tick method used	Date of Transaction	Amount
by cheque to WISENET Inc (see below)			
by credit card (Visa, Mastercard, Bankcard only)			
in person at any branch of the Bendigo Bank*			
via internet banking*			
via telephone banking*			

\*WISENET's account is: WISENET Inc., Bendigo Bank, Canberra Branch BSB 633-000 A/c No 125 816744

PLEASE note on this form which method of payment is used. If by cheque or money order please post this form with your payment to **WISENET SUBSCRIPTIONS, 8 EWART ST, MALVERN VIC 3144**. If by direct payment into the Bendigo Bank, please provide payment details and post this form to **WISENET SUBSCRIPTIONS, 8 EWART ST, MALVERN VIC 3144** or fax to **+61 3 9887 8773**. A receipt will be forwarded as soon as payment has been confirmed from our Bank Statement.

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Fax ..... Email .....

Occupation: .....

Education: .....

**NOMINATED LINK GROUP** (please circle): ACT, Sydney (NSW), Wollongong (NSW), VIC, QLD, WA, SA/NT, TAS

I agree with the objectives of WISENET (signed) .....

If paying by cheque, I enclose a cheque payable to WISENET for \$ .....

If paying by credit card   
  Bankcard   
  Mastercard   
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# For Further Information

Refer to website for regular updates

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MALVERN VIC 3144

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### *Website Editor*

Position Vacant

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### *WA Convenor*

Position Vacant

### *TAS Convenor*

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### *SA/NT Convenor*

Position Vacant

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**Journal Contributions can be forwarded to:** [convention@optusnet.com.au](mailto:convention@optusnet.com.au)

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