



**emcrforum**



Science Pathways 2015  
Effective science  
communication  
for EMCRs

CONFERENCE  
REPORT

## Science Pathways 2015 – Conference Report

### Effective Science Communication for EMCRs

#### Day 1 – Thursday 23<sup>rd</sup> April, 2015

After putting together an impressive program jam-packed full of accomplished science communicators, the EMCR Forum was cautiously optimistic about its third National Meeting. Adelaide was the setting for what promised to be an exciting one and a half days of practical workshops, best practice seminars and expert panel discussions.

#### Official opening

**Dr Leanna Read**, the Chief Scientist of South Australia, officially opened the meeting, giving context to the theme (effective science communication) and highlighting what the Department of State Development are doing for EMCRs in South Australia. She emphasised the importance of effectively communicating science and targeting the message to the chosen audience.

#### Key points:

- Successful science projects in recent times have changed the world in unexpected ways (e.g. Apple, 3-D printing, programmable proteins)
- Research grants are difficult to win and the process can be demoralizing
- Trend towards working with centres of excellence rather than individual efforts
- Perhaps your future career is not invented yet?
- Communication is all about getting through to the listener, information is just data
- The role of the Chief Scientist and the SA Science council include: science topics, STEM education, effective policy and communication
- There is a SA State committee for ECRs
- Some recommendations and highlights of science in SA are:
  - To teach business skills to undergrads
  - Tall poppies program
  - Grants to connect industry and academia
  - Sessions to politicians
  - Royal Institute Australia (RIAus) and science communication centres
- Ultimately the career choice is not important - learning science skills and problems applies to lots of fields
- However, there is less participation by women, and women should play an important role

## Session I

Session I started with the Chuwen Keynote Address given by **Associate Professor Heike Ebendorff-Heidepriem** in honour of Dr Ben Chuwen, founding member of the EMCR Forum, who passed away in April 2012. As Deputy Director of the Institute for Photonics and Advanced Sensing (IPAS) at University of Adelaide, Heike is at the cutting edge of transdisciplinary research in her field of optical materials and structures. She gave some great examples of collaborations and projects that have required contributions from an array of disciplines. She made it very clear how stimulating and intellectually challenging these were to establish and maintain.

### Key points:

- Researchers should work side by side with a common purpose/question
- Challenges of transdisciplinary research:
  - Learning the language of another discipline
  - Explaining your own research to non-experts
  - Prioritisation of projects
  - Managing communication in larger teams
- Opportunities/benefits of transdisciplinary research:
  - Solving complex problems
  - Solving real world problems
  - Intellectually stimulating
  - Understand other disciplines
  - See your discipline in a broader context
  - Fundamental science to transform another discipline
- Patience and perseverance are key characteristics for all researchers

### Question time:

Q: How do you apply for grants in a transdisciplinary field when the ARC asks for one Field Of Research (FOR) code?

A: Establish core expertise in discipline and apply in that area, then go to other disciplines.

## Session II

Session II discussed the art of communicating science with an objective to provide delegates with practical hints and tips to improve their communication with:

- the public and the media (**Dr Susannah Elliott**, CEO, Australian Science Media Centre)
- industry (**Dr Stefan Harrer**, Science Technical Assistant to the Director, IBM Research and **Philipp Dautel**, Research Facilitator, AusIndustry)
- policy makers, politicians and Government (**Anna-Maria Arabia**, Science Policy Advisor to Hon Bill Shorten and **Stephen Halliday**, Director, Hawker Britton Group)

### Key points:

#### Susannah Elliott

The main aim of the Australian Science Media Centre (AusSMC) is to get evidence-based science to the public via the media (database of 5000 experts, 1,320 journalists and have injected scientists into 85,000 news stories since opening)

- Australian media is in a state of flux. At least 50% decline in specialist reporters, those left have less time for complexity
- Why bother?
  - We owe it to the community as most science is publicly funded
  - >80% of public get their information about science from the mainstream media
  - Lack of scientific literacy in the population (27% of Australians think that dinosaurs co-existed with humans – STA poll)
  - If experts don't speak to the media, someone else with a vested interest will (i.e. campaign groups, pseudoscientists and those with political or commercial agendas)
  - It will help your career to engage with the media (can increase citations and your H Index plus institutions are starting to value or even require good communications skills and media engagement)
- Responsive communication – With the growth in social media, the public now drives the media. Journalists use social media to find stories, get a glimpse of what is trending in the public sphere and look for good communicators. You can engage directly with the public and journalists via social media
- Top tips for researchers:
  - Understand the current media environment
  - Follow the science narrative in the news (particularly in your field – how is your area of science being framed for the public? Who is reporting in your area?)
  - Be bold, but not inaccurate (learn how to write snappy headlines that attract attention)
  - Be visual – use images, video and animation (very important!!). It's worth devoting time to creating visual tools to illustrate your work (and developing analogies and visual language)
  - Build your online profile – what does your twitter feed, LinkedIn say about you? Is it consistent, overall impression? Populate sites with good material – Scimex (the Science Media Exchange), your university profile, The Conversation, etc.

## Resources:

AusSMC is a mediator between science and the media and helps encourage rational debate by providing evidence-based information to journalists [www.smc.org.au](http://www.smc.org.au)

[Scimex.org \(the Science Media Exchange\)](http://Scimex.org) – setup by AusSMC to bring more science to the media and enable scientists to connect with journalists: 1,500 journalists from Australia and NZ are registered with the site and can find science news and expertise. You can develop a profile on Scimex and also pitch story ideas (80 word summaries)

[Sciencemediasavvy.org](http://Sciencemediasavvy.org) – created by the AusSMC to help scientists work more effectively with the media

## Question time:

Q: Do you have a relationship with government departments such as DSTO?

A: Yes, but it is a work in progress. We are finding ways to work productively with government departments but we acknowledge that it is more of a challenge than university-based research.

## Stefan Harrer

- The basis of research is creativity and ideas – a company doing research needs to give their researchers a voice. At IBM every researcher is given an opportunity to voice what they think is in the future. A series of proposals and pitches run as part of what IBM calls its Global Technology Outlook and influences future investments into exploratory research
- It is inspiring to see researchers that think outside of the box
- Effective communication is the key – talk to a lot of different stakeholders along the way
- Understand your audience: you might face opposing, challenging, large, one-on-one, enthusiastic, non-interested environments
- Know the audience before you go into the conversation and be prepared but be adaptable
- The essence of good communication is to summarize clearly – if you can't describe the problem in simple terms you probably don't understand it well enough - simplicity is important
- Can you describe what you are doing in a quick conversation? Imagine a 30 second elevator pitch
- Bigger/more is not always better. Details are not important if you miss the point. Not perfect is usually good enough
- Be pragmatic – simplify your take-home message down to the core deliverable
- **Put your key message at the beginning of every pitch – not at the end!!**
- Be concise
- The perfect solution usually takes too long and costs too much; think laterally
- Have back up plans, and be able to adapt to changes in the environment
- Tenacity is important – don't ever give up. Have perseverance; there usually is a solution, you just have to find it.
- Evaluate your ideas as you go and let them evolve throughout the process - don't give up too early
- The same kind of thinking which caused the problem usually won't solve it

## Philipp Dautel

- Engaging with industry can have a positive impact on society – e.g. CricoTrainer: a task trainer that teaches nurses / paramedics how to do an emergency airway puncture as a last resort to get air in your lungs, designed and developed by White & Weiss (UniSA) in collaboration with specialist medical staff at the Royal Adelaide Hospital
- Your developments may be translated into something that may make an important difference (e.g. medical training devices)
- Identify research to help solve real-life industry problems
- AusIndustry provides support to assist the development and translation of research findings (acting as the ‘middle man’ between research and industry)
- There is no specific guide for industry engagement
- Key issues with engaging with industry:
  - Researcher/Uni:
    - Difficulties to free up some time between other commitments
    - More interested in long-term projects to secure position over 2-3 years
    - Need to publish
    - Projects are not challenging enough
    - Research organisations over-protective of their IP
  - Small and medium sized enterprise (SME):
    - Researcher not available to meet their timeline, short deadlines
    - Difficult to understand the value of research (depends on the industry) – less so if the director has had a research career (biotech, mining)
    - No clear communication of desired outcomes
  - Department of Industry
    - Difficult to get the SME in the programme (eligibility)
    - Difficult to meet the project’s eligibility criteria (min 30% of time)
  - Me (Philipp Dautel in his role as research facilitator at AusIndustry):
    - Identifying the actual research need
    - Finding the right research capabilities quickly
    - Too many points of contact within research organisation
    - Researchers not delivering or responding
- Tips for Industry engagement:
  - Be curious: attend industry meetings and conference to understand the current challenges, think of the broader community too.
  - Be relevant and specific: need to be at the right spot at the right time, be visible and present at lots of venues, focus on what you will do in this specific instance
  - Think entrepreneurial – don’t promote your research, promote the value you can add to the product, or to society, talk in plain language and make it tangible, focus on a return on investment
  - Deliver – if you can’t do what you say what you would do people will pull out, don’t overpromise, be realistic about what you can do or provide

Take-home message: Go out and deliver great industry-research collaborative projects. Industry needs your knowledge to create great products and services. Maybe your next project will translate your knowledge into a product that helps save people’s lives. Wouldn’t that be the most rewarding thing in your career?

## Resources:

AusIndustry Entrepreneur Development

E [philipp.dautel@businessfoundations.com.au](mailto:philipp.dautel@businessfoundations.com.au) M 0477 748 261

## Question time:

Q: Industry expect a lot for very little, keep IP and provide no funding. How do I deal with this?

A: You get what you pay for. If you do a consulting project and deliver a result they can own it – big difference between using and owning IP. Business wants to use IP, Institutes want to own it.

Negotiate owning IP, but letting business use it for profit.

## Anna-Maria Arabia

- Not here as spokesperson for Bill Shorten
- Bill Shorten has chosen to be Labor's spokesperson for science because of its importance to all portfolios. He wants to see science become a national priority. Grassroots ground swell of activity is needed to trigger bipartisan political support for science. Scientists need to address both sides of parliament to get support
- Being politically active does not mean politicising your science!
- Focus on 3 things:
  1. Why is it important for scientists to advocate to politicians?
    - Campaign regularly – advocate and have a voice in the good times, not just in the bad
    - Many demands on scientists' time – why should you advocate for policy change as well? Why become politically active?  
Useful tips can be found at this website:  
Coalition for Life scientists (<http://www.coalitionforlifesciences.org>) – advocate on behalf of medical researchers – give tips and hints for advocating for your work; contribute to policy development, lists tips for advocating for research. US site but can be applied in Australia. The site provides simple tips on how to advocate; just 10 mins a day to make a change
    - Advocacy is important for democracy
    - Needn't be intensive – can be sign a petition, make a call – see the above website for tips
    - If you have less than 10 mins you may wish to call your local member of parliament or those who are interested in your research
    - Speak to your neighbours, friends and family, etc. – it is important that the broader population also understands your plight and advocates for science; share your story with friends, neighbours, non-scientists
    - If you have 30 mins you may wish to invest some time in speaking with a journalist
    - If you have more time perhaps write an opinion piece
    - Scientists need a united voice – much more powerful if speaking with one voice and coming at it from many areas (gave examples from NDIS and Gonski reforms where united voices made a difference in policy)
    - See reference in *Cell*: Why biologists should be political? (see below)
    - Read *The Geek Manifesto* by Mark Henderson
  2. How polities use science?

- To improve science policy you should aim to achieve bi-partisan support
  - Science can and should become a national priority, a voting issue (75% of growing industries in Australia rely on the STEM workforce)
3. What do polities want to hear from scientists?
- They want to hear about your reality
  - Scientists have a good and important story to tell – it is fascinating and gives politicians real examples and reasons to fight for science
  - Make sure you include key facts that paint a picture of your reality (sometimes referred to as “killer facts”) e.g. “science adds 50% more to economy than infrastructure”
  - Previous examples of what funding has done – good and bad
  - Make contact with parliamentarians
- Science community is currently not speaking with a strong enough or coordinated voice: **now** is the time before coming election in 2016:

### Resources:

Coalition for Life Scientists <http://www.coalitionforlifesciences.org>

Cell Paper on communication “Why biologists should be political?”: [http://www.cell.com/abstract/S0092-8674\(12\)01170-1](http://www.cell.com/abstract/S0092-8674(12)01170-1)

‘The Geek Manifesto’ – Mark Henderson: <https://geekmanifesto.wordpress.com>

### Question time:

Q: What is the obstacle to getting parliamentarians to understand the economic impact of supporting basic science?

A: You need strong grassroots action to deliver facts consistently and with perseverance. Start delivering these messages now for the 2016 election. Persevere, rightly or wrongly squeaky wheels receive attention. The science community needs to speak with a unified and strong voice.

### Stephen Halliday

- Hawker Britton Group is a Government relations lobbying firm between industry and government
- Science and government have interesting collision points, particularly at the state level
- Shortening of media cycle has totally compressed political discussions – previous 2 day policy debate becomes morning discussion
- No time for careful research and accurate answers.
- Media also demands black and white answers
  - Scientists often only called in when things go wrong – call with good news stories. Advocate when times are good.
  - Science often wants to give nuanced answers and context – not amenable to media demands of 5 second sound grab that is unambiguous
- Less scientifically informed and sceptical of science
  - Not helped by a media trait that there are always two sides to every side that both require equal weight
  - Galling for scientists to be involved in such debates

- Science rarely gives guarantees, however journalists want yes or no answers. Tremendous pressure for Government to deliver accurate answers. Not many scientists are advisors, so getting informed and evidence-based answers is difficult
- Government doesn't have enough time and are under pressure to respond rapidly; little knowledge amongst government, or the public, which too easily trusts celebrity experts
- Take every opportunity to engage with political staffers about your work and policies that affect your work
  - Better to do this at a time outside of crisis
  - E.g. Science meets Parliamentarians – should operate in each state (if they don't)
  - Meeting with backbenchers as well as ministers. Build relationships via frequent contact. Backbenchers are ministers of the future, we are scientists of the future – get together now
  - Create opportunities to engage in a forum
- Use the resources at hand to communicate – particularly internet and social media about the importance of science and impact of policy on science
- Correct the incorrect, but politely
- The better that government and community work together with science, better the outcomes for all concerned
- Science is a collective tool to find and fix things and should be celebrated as such

This session was very well-received by delegates, so much so that an executive decision was made to allow speakers extra time to talk and answer questions. Whilst this resulted in a change to the schedule and a loss of time to discuss the ideas in breakout groups, the anecdotal feedback confirmed that the session was invaluable.

## Session III

Immediately following lunch, **Simon Clews** (Director, Writing Centre for Scholars and Researchers, University of Melbourne) delivered an interactive workshop with the intriguing title: 'What have you got to say and how are you going to say it?' Simon challenged everyone to think about how they communicate their research and science to different niche audiences.

### Key points:

Simon opened with I don't know what a "workshop" is so I'm just going to rant for 40 minutes, and then you can ask questions. How are you going to say it? Through the media, books, and other outlets that reach the "general public". But the "general public" is not a homogeneous identity; it's made up of distinct, niche audiences. Keep this in mind and pitch your story at that specific audience.

### Why do this?

- The numbers game:
  - A thesis is read by approximately three people, after so much effort
  - Write a book: 3,000 people might read it
  - Write a monthly magazine article: 30,000 readers
  - For the SMH, The Herald, The Age, etc.: 300,000 readers
  - Simon found it sad that so much energy is spent on a thesis, which reaches so few people
- A career-smart move: engaging with the community is now essential and part of many academic job descriptions
- Financial gain: get paid, as these audiences will not only appreciate it, they'll put their hands in their pockets
- Lifestyle gains:
  - 15 minutes of fame (you all know you want it, deep down)
  - Have lots of fun
- Responsibilities:
  - Most researchers work at publicly funded institutions, or have publicly funded grants, fellowships, etc.
  - Genuine interest in "what are we getting for our money?"
  - Rally public support for science to shape universities of the future.
  - Who knows what universities of the future will look like?
  - Want public to know what universities do, be excited, not want cuts
- Research and science communication are not an either/or: getting work out to general readership doesn't have to at the expense of academic work eg highly prolific Dr Karl

### Basic principles

- Only two sorts of writing: good and bad
- Academic writing is an example of bad writing since it's not accessible, it's a historically determined writing style full of jargon, specific scaffolding, footnotes, and other atrocities.

- **Read more**, not just scientific literature.
- **Write more** or the “writing muscle” will atrophy.
- **Edit more**: without exception, everyone writes too much and... needs a good edit!
- If you really want to get your message across you need to remember you are... writing for a *reader*

For outreach you will need to: step back from your expertise and start from scratch

- It’s not “dumbing down”; it’s crystallising the message (like a good jus); it’s making it accessible. Remember, other “people are as smart as you, they just haven’t done your research”.
- To effectively get your message across these days you need to develop a “platform”. That means you need to be noticed, and to be noticed you need to be “someone”; become “talent” in an acting sense. To be “someone” you need to:
  - Start a blog, twitter, tumblr, flickr, etc.
  - Give talks (NOT to peers on campus or at conferences).
  - Find an audience who don’t know you, don’t know anything about your area, don’t care, and get them excited, asking smart questions. If this happens, then you’re a good communicator.
- Recapture the spark that made you want to do a PhD. Be able to communicate this, then you can get any job, grant, etc.
- Build up your platform and get known by the following progression:
  - Writing a letter to the editor (it’s a rite of passage)
  - Phone in to a radio talk back show.
  - Use short, sharp, accessible pieces to get your message across
  - Invited radio appearances (go to the station in person)
  - Opinion pieces
  - A short article
  - Long/magazine article (2000-2500 words)
  - A book
  - TV series, feature film, and beyond
  - Doesn’t fit anywhere specifically within this progression: book reviewing
- But first, you need to start writing better!
  - Shorter words, shorter sentences, shorter paragraphs: be short, sharp, and to the point
    - read E. Hemingway’s “the old man and the sea” for an example of writing with no excess words
    - Orwell made sure every word was there for a reason
  - Choose active verbs over passive verbs: eg “it is thought” -> “I thought”
  - No jargon, acronyms, etc.: it’s designed to be exclusive
  - Qualify unknown concepts, people, places, etc.: introduce the first time used
  - No “academic words” e.g. “discourse”
  - Tell a story and the brain empathises and stays interested; straight information and the brain turns off
  - Put the writer in the picture

- Be conscious of the reader and never talk down to your audience

Simon put a challenge to the audience. You're all busy, so have a plan. What are you going to do:

- By the end of April?
- By June 30<sup>th</sup>?
- By December 31<sup>st</sup>?
- Over the next 5 years?

Have a single aim for communication to the outside world for each of these timeframes.

### Question time:

Q: What about missing information, subtleties, not the full story etc. in the truncated space/time?

A: Receiver doesn't know things have been missed out or misinterpreted, but you'll have ~300,000 people care about your topic, enter public debate, and so forth.

Q: The subtlety being lost is a big issue. You showed headlines around this at the beginning!

A: 5 page media release in bioethics (too long!); resulted in WWIII. But then invited onto intelligent media to explain in more detail. Hopefully any bad/wrong PR will then result in follow-up to enter a public discussion.

Q: What about metrics? How can you tell if you've been successful?

A: Have aims and objectives when communicating, which will determine the criteria for success (have you met them?). Funding bodies now care. Might not be easy to get it to count, but you can push to make sure it does, and it's counting for more and more.

## Session IV

Session IV was again focussed on transdisciplinary research delivered by **Professor Ana Deletic** (Director, Monash Water for Liveability, Monash University). With a research interest in Urban Water and Sustainable Green Infrastructure, Ana described how her cooperative research centre (CRC) gradually incorporated more and more experts from quite disparate disciplines to deal with the complex challenges that they faced.

### Key points:

Four key ingredients for effective communication and interdisciplinary collaboration were highlighted as:

1. Patience
2. Respect (mutual)
3. Simplicity (of communication and language)
4. Positivity and Passion

Afternoon Tea was followed by a general homework session where 3 questions were thrown to the floor:

1. **Why should we communicate our science?**
2. **How do we measure the impact of your science communication?**
3. **How can we improve our science communication?**

Some great suggestions were put forward, which set the scene for the Action Plan session which was scheduled for the end of the meeting on Day 2.

## Networking event

One of the greatest logistical challenges then faced the organisers (getting 150 people from the University to the Science Exchange building at the other end of town). Amazingly (thanks to a few local SA delegates), this went (mostly) to plan, with all delegates arriving to the Networking function safely. The first item on the agenda was to split up into coloured paperclip groups for only 10 minutes to brainstorm a 60 second pitch on a nominated theme. The resultant presentations were of amazing quality given the limited preparation time, dealing with unfamiliar teammates from different disciplines and the pressure of delivering a coherent and effective message in only 1 minute. This made the judges (Dr Melissa McBurnie, Investment Manager, Brandon Capital Partners and Dr Ben McNeil, Founder, Thinkable.org) job hard. It was decided that the red and pink teams could not be split, so they were announced as the winners of the highly coveted EMCR Forum wine.

Ben McNeil then officially announced the Thinkable.org “Emerging Research Leaders Inspire Australia” video competition that will be open to all EMCRs across Australia, hosted by the EMCR Forum. There is an initial prize pool of \$2,000 (\$1,000 from the EMCR Forum + \$1,000 from Thinkable.org), which we hope to build over the duration of the competition. Look out for the competition on the [thinkable.org](http://thinkable.org) website, it is open now.

The interactive social engagement continued (until the bar was closed). However, it is rumoured that the networking continued on for some time after at various Adelaide establishments.

## Day 2 – Friday 24<sup>th</sup> April, 2015

### Session V

Day 2 kicked off with a different format: a panel discussion with no slides, comfy seats and an experienced facilitator in **Niall Byrne** (Creative Director, Science in Public). The Session V panel consisted of an all-star female cast including: **Reema Rattan** (The Conversation), **Dr Cassandra McIver** (Australian Institute of Policy and Science), **Dr Sarah Keenihan** (Australian Science Communicators) and **Nicky Phillips** (Sydney Morning Herald). Apologies were also passed on from **Sally Woollett** (Chemistry in Australia) who came down with laryngitis the day before the meeting started. The journalism panel provided attendees with a lot of very practical useful advice for communicating with and through the media.

#### Key points:

#### Sarah Keenihan

- Loved working in the laboratory, but wondered whether she would survive the long-term pressures of a career in science. Looked for other ways to remain involved and eased her way into science communication
- Grand challenge of science communication is to know your audience
- If you want maximum control of your message, write a blog

#### Reema Rattan

- ‘The Conversation’ is written by researchers, with help from editors
- If you publish in the media then you’re helping to recruit the public to promote science and fight for support
- When there is a topical story ‘The Conversation’ will contact researchers to write on it (700-1000 words ASAP)
- Need to be aware of the different time frames in media (fast) compared to science (relatively slow)
- Start developing writing skills by blogging and tweeting
- Timing is everything, you may have an interesting story, but if you wait for a linked news report it will more likely to be picked up
- Most articles are commissioned, up to 80% of pitches to the health & medicine desk are rejected
- About 63% of researchers who write for The Conversation get follow-up media exposure
- Where you publish will depend on who you want to reach
- There will be a risk when you write online, don’t be intimidated: The Conversation now has moderators

## Nicky Phillips

- Each day there is up to 50 science story ideas, papers, press releases; about 10 could be appropriate for the Sydney Morning Herald (SMH), but 1 or 2 will become SMH stories
- If you do a press release give it a really striking headline or contact the journalist directly
- Science editors will listen to pitches from real scientists, more often than press officers
- Need to convince journalists why the public should care about your story
- Journalist will ask themselves: why is this important? Why would my readers care?
- Message needs to be accessible and interesting to the general public
- Commercial media has the widest reach
- The more people that write about science and its relevance, the more the public will be outraged if it is cut
- Newspapers kick off the media cycle, lead into radio and TV
- Very appealing to have a participant involved in your story if possible
- Practise your writing, read blogs and newspaper stories to see how they are written
- Pitch opinion pieces! There needs to be more EMCRs doing this
- Good to comment on fluffy science stories, you get out there and also make a journalist contact
- Journalists know that you have a message, they will question you on it. Be prepared!

## Cassandra Mciver

- Speaking to primary schools is a great way to learn to pitch your science simply
- Keep your online profile/websites updated!
- Tall poppies have been going for 15 years, have helped many careers

All panellists gave great insight into what is involved in their current roles. Taking questions from the audience and engaging with delegates in a more informal way made for a stimulating session. I would be very surprised if most, if not all, delegates were not inspired to get out there and advocate for science.

This was potentially already happening in real time on Twitter via the [@EMCRForum](#) account and individual delegate accounts, resulting in #SciPath15 trending on both days.

## Session VI

Session VI was delivered by **Dr Kristin Alford** (Futurist and Founding Director, Bridge8 Pty Ltd), getting everyone to think hard about what a future Australia would look like given different future thinking scenarios (growth, restraint, catastrophe or transformation). With themes including social engagement and inspiring future generations, this made people think differently and learn how to be better global citizens.

### Key points:

#### Social engagement for the future: Australia 2050

- Making a difference in your own field isn't enough to change the world
- The future is influenced by our relationships, by the systems we build and the things that we value – we can't have an exclusive view that science is all that matters
- Most people are able to capture 1-5 years, but we should be thinking even further into the future
- Even split between the optimistic and pessimistic view of what influence we can have on people
- Kristin is pessimistic about the amount of areas that we need to fix for the future
- *Will Steffen et al. Science 2015; 347:1259855* - We've reached beyond the zone of uncertainty in 3 areas - I fear what state we might move to
- It is hard to tell what is natural and what is affected by humans (e.g., local creeks that are influenced by concrete to change their flow)
- Humans are affecting the environment more than the environment is affecting us
- The project formed groups to ask questions of what needs to be done to define a safe space for the future
- How do we deal with things like increasing obesity, increasing urbanisation, increasing commute times (which can all ultimately lead to depression)
- Humans are adaptable – how resilient are people?
- Shifting to “Living Scenarios– possible scenarios for the future: these must be plausible; acceptable; workable
- Conversation is critical in what we do: we need to talk to people who are not like us
- Phase I took 40 people in a group, looking at the future of Australia
- We know that there is value for science to change the future
- Phase II: 50 people from around Australia were selected with 10-12 scientists, those with a history of public service, people who think outside their own sphere, people from different areas. Used archetypes:
  - Growth: things getting bigger – what would Australia look like in 2050 if we had exponential dynamic growth?
    - More people, more infrastructure, more roads, urbanisation, taller, higher density, more pollution,
    - Business: growth, optimistic; Scientists: limits, scary
  - Restraint: Still have growth but we have a restriction (self imposed) to limit it. Regulations as restraint.

- What does the world look like if you apply a constraint? More rules, less pollution, recession, command-control (top down). We have the ability to control what we do – think deliberately about what we can do. The community has the capacity for clever decisions
- Catastrophe: What happens when it all goes bad? War, rationing, breakdown of society
  - Would there be increasing isolation? Increasing laws?
- Transformation: What would a transformed Australia look like? Fundamentally different.
  - How would we be different? Knowledge based economy instead of a resource-based economy. Free public transport, local not global, de-centralised
  - Most wealth in the world is created by hedge funds betting on currencies – wealth is not the same as value
- Discussion topics from this process allowed people to think about their different approaches and perceptions. Our assumptions are shaped from different roots; Progression of the program led to people not thinking so much about governments running everyone/everything
- I knew about...xxx...but I only heard about it through the media. The conversations that scientist have with the public help to shape the world
- Access to education, equity, access to wealth, access to physical and mental health, move value of nature
- Political cycle is 3 years but we need to have a longer cycle of these discussions
- What next? 5 ways to see the future:
  - Past experience
  - Distributed present
  - Projected future – models, ideas, uncovering values
  - Envisaged future
  - Emerging future – listening, being present, seeing how it is unfolding; don't miss the opportunities on the way through. The opportunity to impact the world and change the world is out there
- We need to shake up our way of doing things – we need to be looking at how other people are viewing the world and consider different approaches.

### Question time:

Q: How might science inform the future?

A: Science needs to be in conversation with others to really be able to discuss the issues.

At the end of Kristin's presentation, **John Finnigan** officially launched the *Australia 2050: Structuring conversations about our future* publication. This booklet describes a way to have productive conversations about the future among people with widely different points of view. John summarised the key messages and themes of the book, which were compiled following a workshop that brought together a large group of people from many walks of life. All delegates received their own copy of the book to flick through at their leisure.

### Key points:

- The 4 Academies of Australia combined for the 2050 project to ask: What are the implications of Australia's population on the future?
- We have changed from an economy of resources towards an economy of knowledge
- 80% population will live in cities in the future: can we maintain our current situation?
- Phase 1 outcome: find a method to have a discussion; Phase 2 was having this conversation; Phase 3 was what happened when this was tested on 50 people from all walks of life
- Previous things we couldn't have predicted can help us to predict the type of differences that might drive the future
- Where do we want to aim for – 3 questions asked:
  - What do the ideas mean to you?
  - What would Australia look like under these scenarios?
  - How do we get there?
- Strong tendency to be optimistic on mode archetypes
- Recognition of both positive and negative implications for the future: need for greater social cohesion
- Top down restraint isn't good but how else can we get operational restraints to happen?
- Almost every person shared the same view that Australia should be: caring, community focussed and fair, but there were differences in the pathways for that to happen
- Science can then focus on adding rationality to the plans
- Retention rate for population is about 2.1 children/woman. Worldwide we are at 2.3 children/woman but for the majority of skewing is due to sub-Saharan Africa. Expected that there will be a cap of 9-10 billion people long term
- Rebound effect: if you make something easier to do, then people will keep doing the same thing but start to increase the amount i.e. free electricity will not cut amounts used

## Best Practice Session

Before lunch a best practice session was delivered by **Dr Maggie Hardy** (EMCR Forum and University of Queensland) describing how (and why) she set up the Science Ambassador Program at the Institute for Molecular Bioscience (IMB). Maggie also opened up the conversation on 'alt-metrics' and how we can measure the impact of science communication. This was the ideal segue into the afternoon session on 'Developing an action plan'.

### Key points:

- Are we people or robots? We need to emphasise that we are members of the public as well as scientists
- Communicate to try to get people to engage with science – make people want to support the science and write to their ministers in support of our work
- Radio interview looking for industry partner led to funding for her first post-doc position for 2 years
- ATSE – Academy of Technical Science and Engineering Young Science Ambassadors: speak to schools to try to get people to be enthusiastic about science
- She went to Aboriginal and Torres Strait Islanders Association (ATSIA) to get support who could explain what science funding is available for future science careers
- Talking Scientists program – previous state government program
- Why engage?
  - Maintain control of your message
  - Publicise novel results
  - Connects with collaborators/funders
  - Quantify engagement and impact
  - Keep in touch when away
  - Good for time-poor researchers, ECRs
  - Improve Alt-metrics
  - Visibility
- Use your twitter account stats to explain your reach. Use these for people who have career-disruptions.
- IMB Science Ambassadors, pilot year 2009: why start a program like this?
  - People are already doing the work, it just hasn't been formally recognised or supported
  - Training ECRs to speak to public, media, funders
  - CV-recognition of engagement work – for awards or grants
  - Interest from our constituents:
    - IMB is research-only
    - No undergrad students, so need to become more visible
    - Help with student recruitment, training for media futures
- All participants felt that there was a significant improvement in their comfort in areas of communicating
- Now there is an employee who helps to run the ambassador program

- These programs help to understand the language to be able to communicate complex ideas to people
- Open access articles will result in more visibility than before, but you can use different avenues to help to promote your research.
- Currently men are more often known as experts in the media than women are
- Women only form 38% of people who are writing about science (the same as writing about entertainment)
- There is a lot of scope for women to write articles, and accept the 80% rejection but just keep trying
- *@MD\_Experts – Media Diversified Experts Directory* can help improve visibility and diversity in science
- Women academics have a lower visibility so need to take every chance to speak more
- We need to argue that we are people in addition to scientists – do this in addition to talking about science
- Use these tools to quantify our value and worth

### Question time:

Q: Does time on engagement retract from research activities?

A: It has helped with my promotion, generally the communications person is on the executive so if they know you then that helps. Citations can be driven up by these things too so that's a benefit. Always do interviews or take opportunities because you can get lots of benefits from these.

Q: Where do you get the training modules for the ambassadors program?

A: IMB's communications people have helped to develop the modules. IT and journalism students have also helped come in and train/practice.

## Action Plan

The objective of this last session was to get as many different opinions, suggestions and view on the questions raised in the Homework session (page 12 of this report). Further to this the short-, mid- and long-term goals and action items were listed with an emphasis on individual, institutional and national responsibility. The EMCR Forum obviously can most effectively address the national level, but can also influence the Institutional/individual level. A perfect example of this is the [Gender equity: current issues best practice and news ideas](#) document that was released by the EMCR Forum in March 2013, which has had a major impact.

### Question 1: Why should we communicate our science?

- Why not?
- Become famous
- Public want to know; want the tools and information (empowering the public)
- More people read your research; give science a face
- If we don't, who will?
- If we want to influence government policy
- We're employed by the public, therefore we owe it to the public to communicate and share what we do
- Obligated to explain the value of what we've done; the value proposition
- Need to raise debates about important topics
- Sometimes can't communicate the science due to confidentiality
- Because we want to; because we're passionate
- If we don't like the conversation, we need to be the ones to change it

### Question 2: How do we measure the impact of science communication?

- Increased funding from the government
- Different measurements needed for media vs. public vs. government
- Do we get feedback? Is it being discussed?
- Value e.g. newspaper articles in CVs, funding bodies
- Short-term metrics (downloads); longer term metrics increased scientific literacy
- Children interested in science; increase in applications to degrees in STEM subjects and in students enrolling in physics or chemistry in high school
- Measures of scientific literacy; vaccination rates, climate change support; are they getting traction in media? Quality of the public discourse

- Twitter followers
- Don't focus too much on metrics: can be counter-productive, can be gamed, are overly simplistic, don't reflect what we're trying to achieve
- Depends what you want to get out of it: public profile vs. career advancement, etc.

### Question 3: How can we better communicate our science?

- When we communicate science we should use language which provokes emotion
  - Not dumbing down or giving in – still real science
  - Not same respect for expert knowledge in general community; less emotive language communicates that authority
  - Never use 'spin' over facts
- A good communicator is a good listener
- Target your pitch/story/idea to the audience
- Have a purpose; what are we trying to communicate, what are we trying to get out of it?
- Sell the significance of the work; not just information about the discovery (but overselling is just as bad, can be damaging)
- Transmit the passion and excitement
- Not just communicating "our" science, but science in general; the scientific method
- Make it a priority within the scientific community, get more scientists engaged
- Work with journalists and communications experts
  - Write your own hook
  - Be persistent 'til you find the "good" ones
- Be careful of an "us vs. them" perception; we're part of the general public
- Being a skeptic; conversation about the poor reporting of science
- Have a conversation; two way communication

## Short-term goals (<6mo)

### Orange - EMCR Forum responsibilities

- Better networking for ECRs at the institutional level
- State-wide EMCR networks
- Better understanding of institutions that already exist, with different requirements e.g. DSTO vs. academia
- Increasing EMCR forum visibility – more communication channels
- Official document/report on this meeting
- Include 'alt metrics' etc. in your CVs, websites, etc.
- Open a twitter account
- Add people from this meeting to your Linked In account, etc.
  - Cross-disciplinary links
  - Should we set up a group?
- Networking = forming future networks; growing up together
- Media training
- Ask your institutions what they want to get out of your media/public engagement
- Social media training: need to move beyond the basics, using it as a professional
- Media club similar to a Journal club to look at media releases, etc.
  - Via social media; twitter, online groups? Ad hoc or scheduled?
  - EMCRs to offer constructive criticism
- Provide template letter to contact local members

## Mid-term goals (6-12mo)

### Orange - EMCR Forum responsibilities

- Career awareness and promotion of careers outside of academia
- Recognition of transferability of skills
- Policy doc from EMCR Forum about science communication, including/measuring them in promotions, grants, etc.
- Creating national voice for EMCRs
  - More talking, media presence, public debate
  - Unite behind key messages
  - Public awareness of what “EMCRs” even are – what is a “postdoc”
  - What policy decisions mean for us
- Increase the awareness of the EMCR forum
  - Advertise at science conferences etc.
  - Provide slide on website for other EMCRs to add to the end of their presentations, flyers?
  - Host breakfasts, other “networking” events

## Long-term goals (12mo+)

### Orange - EMCR Forum responsibilities

- Increase the awareness of the EMCR forum
  - Host scientific talks
  - Booth at conferences with banner etc. – information packs for this?
  - Currency in trading inserts with other conferences, access to members
  - Liaison roles at institutions
  - Provide acknowledgement of societies who’ve supported
- Primary platform for EMCRs to tie into other more specific networks

## What next? Ideas for Science Pathways 2016

- Session(s) for general scientific presentations about research from attendees
- Multi-disciplinary research at the big picture level
- Non-traditional funding sources – success and failure stories (what not to do)
- Present big problems (grand challenges): discuss and brainstorm
- General diversity (not just gender)
- Half a day groups, second half show us your science (hands on)
- International science research priorities
- Engagement with schools at different levels; primary, high, early university
- Recap at each meeting: what we've achieved, goals met, goals still being worked towards, etc.
- Future thinking; strategic planning; where to next?
- Leadership and development skills

The meeting closed under overcast skies, but a ray of hope for Australia's future research leaders to be better communicators and true advocates for Science in Australia.