STEM 2024 Agenda – Friday 15th November

8:00am – 9:00am   **Registration, Coffee, Expo**

Plenary Session

9:00am – 9:05am   **Acknowledgement of Country**

9:05am – 9:15am   **Welcome**: Master of Ceremonies

9:15am – 9:40am   **Keynote 1:** *Where can STEM take me?*

Professor Lisa Harvey-Smith - Astrophysicist | Author | Women in STEM Advocate

9:40am – 10:05am   **Keynote 2:** *Unlocking the Secret History of Ed-tech*

Brett Salakas – HP Education Ambassador

10:05am – 10:30am   **Keynote 3:** *Unleashing STEM potential: Engaging students in using remote and robotic telescopes*

Lena Danaia - Associate Professor of Science Education, School of Education Charles Sturt University

10:30am – 10:55am   **Keynote 4:** *Transforming STEM: Best Practices for Inclusive and Engaging Education*

Professor Scott Sleap – STEM Enrichment Coordinator, NSW Department of Education and Professor of Practice in STEM, University of Sydney.

10:55am – 11:15am   Morning Tea, Expo and Networking

Deep-Dive Session (3-hours + lunch)

11:15am – 12:15pm   Deep Dive session (List below)

12:15pm – 1:15pm   **Lunch, Networking and Expo Break (1-hour)**

1:15pm – 2:15pm   Deep Dive session continued

2:15pm 2:30pm   **Comfort Break (15-minutes)**

2:30pm – 3:30pm   Deep Dive session

STEM 2024 Keynote Synopsis

Keynote 1: *Where can STEM take me?*

Professor Lisa Harvey-Smith - Astrophysicist | Author | Women in STEM Advocate

For young people and their parents, STEM can sometimes seem like an impractical, academic set of disciplines with a narrow range of possible career outcomes. But government figures show that people with STEM qualifications are in high demand. They earn more than people who are not STEM-qualified, and STEM jobs are predicted to grow twice as fast as non-STEM jobs over the coming years. Through storytelling about her own diverse career in STEM and beyond, and by sharing insights about Australia's STEM workforce trends, Lisa Harvey-Smith explains how STEM qualifications set students up to have greater choice and freedom in their own career journeys.

Keynote 2: *Unlocking the Secret History of Ed-tech*

Brett Salakas – HP Education Ambassador

What if the everyday technology in your classroom held secrets from the past — secrets powerful enough to break down barriers to student success? Join Brett Salakas, HP Education Ambassador for Australia and New Zealand, on a journey through time, revealing the surprising origins of the tools we use every day. Discover how innovations born from Cold War intrigue have evolved into the essential tech driving modern education. In this thought-provoking session, you'll gain a deeper understanding of the untapped potential in your hands and learn how to wield it to "tear down the walls" that keep your students from reaching their fullest potential. Get ready to see technology — and teaching — in a whole new light.

Keynote 3: *Unleashing STEM potential: Engaging students in using remote and robotic telescopes*

Lena Danaia - Associate Professor of Science Education, School of Education Charles Sturt University

Remote and robotic telescopes offer an exciting gateway for students to dive into STEM fields by providing hands-on experience with real-world astronomical tools. These technologies enable students and teachers to conduct real-time observations from their classrooms, fostering a sense of ownership and engagement with their observations of the cosmos. By analysing data from these telescopes, students can develop critical thinking and problem-solving skills, while exploring fundamental concepts in physics, mathematics, engineering and technology. Research has shown that using remote and robotic telescopes can make complex scientific principles more accessible for students, foster a deeper understanding of content and spark interest in STEM careers.

Keynote 4: *Transforming STEM: Best Practices for Inclusive and Engaging Education*

Professor Scott Sleap – STEM Enrichment Coordinator, NSW Department of Education and Professor of Practice in STEM, University of Sydney.

Delve into cutting-edge teaching strategies, including explicit instruction, inquiry-based, problem-based, and project-based learning, that empower both educators and students. He will highlight the importance of equity in STEM, the role of industry partnerships in enhancing learning outcomes, and share practical programs and resources that can be implemented in classrooms to transform STEM education. Discover how these innovative approaches can create more inclusive, engaging, and effective learning experiences for all.

STEM 2024 Deep-Dive Synopsis

Deep-Dive 1: *Learning through Collaborative Problem-Solving*

Daniel Proctor - Deputy Principal Instructional Leader, Gloucester High School

Jocelyn Wray-Davis - Science teacher, Gloucester High School

During this session participants will engage with collaborative problem-solving activities in Science and Mathematics. Based on the principles of Peter Liljedahl's Building Thinking Classrooms, participants will work in different roles with different participants. No death by PowerPoint here. Participants can expect to be out their seats and thinking hard. Participants will walk away with easy-to-use ideas for lesson activities and a greater understanding of deep connected learning.

Audience: K-12

Deep-Dive 2: *From dry to awesome - make STEM concepts come alive with random materials*

Ben Newsome CF - Fizzics Education.

Science journal articles are filled with amazing discoveries... but they also can be rather dry to a student. Challenge yourself in this session as we look at science articles and flip them into teachable lessons using random materials and your creativity. Prepare to fail forwards as we trial lessons on the fly... and have some fun in the process.

Audience: K-12

Deep-Dive 3: *Mars Rover Missions: Integrating the Giant Aldrin Maps and Lego Spike Prime Robotics*

Shane Dryden - STEM Project Officer, Hunter Academy of STEM Excellence

Ben Moore - STEM Project Officer, Newcastle Academy of STEM Excellence

Be guided through an immersive session on utilizing the Giant Aldrin Mars Map to get students excited about coding, apply their knowledge to a set of engaging challenges, and grow their STEM aspirations through Mars exploration. Providing a hands-on tour of resources to support students in learning about and interacting with, Mars' topography while integrating Lego Spike Prime robotics into STEM learning. Guided through the step-by-step process of constructing, coding, and remotely piloting a Lego Spike Mars rover, advancing student skills from beginner to experienced coder through remote piloting and automated rover missions. Students can utilise a mix of block and text-based coding, enabling learners to progressively build their coding proficiency. Get ready to launch your classroom on an educational mission to Mars!

Audience: Stage 2-5 teachers

Deep-Dive 4: *Leading Effective Curriculum Implementation (LECI) in STEM*

Belinda Norrie - Curriculum Reform Adviser, Curriculum Secondary Learners
Sandra Moore - STEM Enrichment Adviser, Curriculum Secondary Learners

This three-hour workshop will provide STEM leaders with a 'deep dive' on the six LECI eLearning modules. The workshop will focus on how to build whole school collective efficacy using evidence-based NSW Department of Education curriculum resources, advice and support. Participants will be supported to strengthen their leadership approach to change and plan for curriculum implementation as part of the teaching and learning cycle. Participants will be supported to plan for STEM centred high impact professional learning (HIPL) and identify ways to evaluate the impact for ongoing sustainability. Together, we will consider how effective curriculum implementation can be harnessed as an opportunity to strengthen leadership practice in STEM and foster a culture where every learner receives a high-quality education that enables them to excel.

Audience: K-12. Written for secondary but suitable for primary teachers, SLSOs and school leaders.

Deep-Dive 5: *Disability, inclusive education, and generative artificial intelligence: A non-ableist perspective*

Dr Natalie Thompson – Lecturer, Education in the Faculty of Arts and Education at Charles Sturt.

Generative AI tools such as ChatGPT have quickly become an integral part of our lives. For teachers, and students, the choice is not whether but how to use generative AI. For inclusive educators, the choice in front of us is how it can be used to make education more equitable and responsive to human diversity. To date, much of the discussion about generative AI in education privileges the experiences of non-disabled people. This limits our understanding of its inclusive potential. Join Natalie for this deep-dive workshop where innovative ideas are shared, using generative AI to reimagine inclusive education in your classroom in disability-affirming and disability-informed ways.

Audience: K-12. Written for secondary but suitable for primary teachers, SLSOs and school leaders.

Deep-Dive 6: *Using literature to develop engaging and challenging STEM tasks in secondary classrooms.*

Dr Lorraine Gaunt – Lecturer, Mathematics and inclusive education at Charles Sturt University

Student engagement significantly influences the quality of classroom interactions and adolescent learning outcomes. Using children's literature is one innovative way of engaging students. Literature serves as a powerful tool for teachers to introduce diverse concepts, practice various materials and methods, and create opportunities for students to share ideas. Storytelling, a crucial form of communication, is deeply connected to First Nations ways of knowing, being, and doing. This presentation will challenge you to explore the use of children's literature to engage and challenge your students through a problem-solving pedagogy across STEM disciplines. By integrating storytelling and literature into STEM education, we can foster a more inclusive and dynamic learning environment that resonates with students' cultural backgrounds and enhances their critical thinking skills.

Audience: K-12. Written for secondary but suitable for primary teachers, SLSOs and school leaders.

Deep-Dive 7: *The Universe in your classroom: Astronomy as the context for Integrated STEM*

Michael Fitzgerald – Project Astronomer at Las Cumbres Observatory and Research Fellow at Deakin University.
Saeed Salimpour – Alfred Deakin Postdoctoral Research Fellow at Deakin University and Associate Scientist at the Max Planck Institute for Astronomy/IAU Office of Astronomy for Education

Astronomy gives students a Cosmic Perspective, and provides students with the opportunity to engage with, and appreciate the deep connections between, STEM and non-STEM disciplines. This deep dive session provides teachers with the opportunity to experience how astronomy can be used as a context within curricula to bring in contemporary STEM perspectives and practices together in an interdisciplinary exploration as well as addressing the straight science in the curriculum. Teachers will have the opportunity to engage with authentic data collected from a network of research-grade robotic telescopes (Las Cumbres Observatory and PhotonRanch), available for use beyond the session, together with practical resources and support on how to bring the Universe into their classroom.

Audience: Stage 4-6

Deep-Dive 8: *Deadly Science*

Corey Tutt – Trailblazing Indigenous STEM champion, Founder and CEO of Deadly Science.

Led by experienced educator and author Corey Tutt, participants will gain insights into the process of how he writes culturally relevant STEM books and learn practical approaches to communicating these perspectives in the classroom. The session will cover strategies for engaging both students and teachers in understanding and applying First Nations knowledge to enrich STEM learning. By the end of the session, educators will understand how Deadly Science resources to seamlessly integrate Indigenous perspectives into their teaching practice, creating a more inclusive and meaningful STEM experience.

Audience: K-12

Deep-Dive 9: *Empowering STEM in the Classroom*

Sabih Rehman - School of Computing, Mathematics and Engineering, Charles Sturt University

Enhance your skills in fostering critical thinking, creativity, and problem-solving in the classroom. This hands-on workshop offers engaging STEM-based activities and collaborative challenges that promote logical thinking, scientific reasoning, and mathematical problem-solving, designed to provide practical strategies for integrating STEM into your teaching.

Audience: Stage 4-6. Written for secondary but suitable for primary teachers.

Deep-Dive 10: *Java Essentials: From Fundamentals to Advanced Concepts*

Dr Jason Howarth - School of Computing, Mathematics and Engineering, Charles Sturt University

Designed to take participants from the basics of the language to more advanced topics, providing a comprehensive introduction to one of the most widely used programming languages. You will gain a solid understanding of Java, from foundational syntax through to advanced topics like inheritance, error handling, and multithreading. On completion, you will be equipped to build more complex Java applications with confidence in Java Basics, Object-Oriented Programming and Advanced Java Concepts.

Audience: Stage 4-6. Written for secondary but suitable for primary teachers

Deep-Dive 11: *AgriSTEM - How to integrate agriculture, food and fibre into your STEM classroom.*

Luciano Mesiti – CEO, Primary Industries Education Foundation (PIEFA)

This will be a deep dive into a range of food and fibre resources, programs and activities available through Primary Industries Education Foundation Australia (PIEFA). There will be opportunities to engage hands on with various resources, try out presenting lessons and programs and there will be take home packs available.

For a sneak peek, go to: www.primezone.edu.au

Audience: K-12