Curtin University

CURTIN SPATIAL SCIENCES COLLOQUIUM 2017

The Department of Spatial Sciences, Curtin University, has introduced a new seminar series in 2014 referred to as the *Spatial Sciences Colloquium* series. These colloquiums will also be taken place in 2017.

The aim is to provide a forum for spatial sciences professionals, practitioners and researchers to hear and discuss the latest developments and vision for future directions. The colloquium presentations will be conducted by academics and researchers who work at the forefront of spatial sciences technology and research including, GNSS, Geodesy, GIScience, Remote Sensing, Photogrammetry and Laser Scanning.

The colloquium events will occur four times per year and provide the opportunity to bring together industry, government and academic partners to showcase spatial sciences achievements and research developments.

The spatial sciences colloquium events are excellent opportunities to emphasize and promote the significance of spatial sciences within WA, Australia and globally.

The Curtin Spatial Sciences Colloquium is supported by

SSSI

When:
The events will take place on different dates in 2017. Please see the table on the right for details.

4:30pm: Welcome (drinks and nibbles)

5pm: Presentation

Where:
Curtin University

Cost:
Cost free event

RSVP:
Petra.helmholz@curtin.edu.au
Bookings open up to 2 day before the event

CPD Points
1 point per event

Contact:
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Curtin Spatial Sciences Colloquium 2017

Welcome and refreshments always take place at 4:30pm before the presentation.

Date	Description	Venue
06/06/	Prof David Cairns (ATM): Research and Collaboration Opportunities at Texas A&M University	207.201
28/03/	Prof. Robert Lewis (Fordham University, New York): Dixon-EDF: The Premier Method for Parametric Polynomial Systems	207.201
21/02/	Dr Jan Weiss (Colorado): GNSS Radio Occultation Science and Applications	207.201

For CPD points, please register on-line at www.sssi.org.au/events

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David M. Cairns is the Head of the Department of Geography within the College of Geosciences at the Texas A&M University. Dr. Cairns' research concentrates on the impacts of climate change on vegetation at short and long time scales in a variety of environments. He has worked extensively at ecotones, the transion zones between different vegetation types. Most of his work has been accomplished at treelines in the western United States, Alaska and in northern Sweden. He also has projects in two other sensitive environments: saltmarshes on the coasts of Denmark and Texas, and in tundra environments on the North Slope of Alaska. He utilizes a variety of methods to answer questions pertinent to the response of these environments to climate change including: population genetics, dendroecological methods and simulation modeling. His current research projects include the population genetics based analysis of dispersal at alpine treeline, the modeling patch-scale expansion of arctic shrubs, the influences of herbivory on treeline under changing climate, the utility of salt marsh vegetation as an indicator of climate change at short and long time scales as well as the forest restoration planning and assessment for the southern pine beetle and other invasive pest species.
David received the College-Level Distinguished Achievement Award in Teaching, Association of Former Students, Texas A&M University, 2012; the Student Led Award for Teaching Excellence (SLATE), Texas A&M University, 2009, and the Dean's Distinguished Achievement Award -- Faculty Teaching, College of Geosciences, Texas A&M University, 2007.

Robert H. Lewis will talk about Dixon-EDF: The Premier Method for Parametric Polynomial Systems. One method of solving polynomial systems symbolically is with resultants. The study of resultants began with Bezout around 1760 for two equations in one unknown. Later extensions to several variables were made by Macaulay (1900) and Dixon (1910). The subject languished for most of the rest of the twentieth century. It was revived in 1995 when Kappur, Saxena, and Yang showed how to overcome a major stumbling block in the Dixon method.
Using examples of interest from real problems, we will discuss the Dixon-EDF resultant as a method of solving parametric polynomial systems. We will briefly describe the method itself, and then discuss problems arising in geometric computing, image analysis, flexibility of structures, chemical reactions, game theory, operations research, differential equations, and others. We will compare Dixon-EDF to several implementations of Groebner bases algorithms on several systems. We find that Dixon-EDF is greatly superior.

Jan Weiss is Manager of the COSMIC Data Analysis and Archive Center (CDAAC) at the University Corporation for Atmospheric Research in Boulder, Colorado. Jan and the CDAAC group are involved in many aspects of the Constellation Observing System for Meteorology, Ionosphere, and Climate 2 mission, which will launch 6 spacecraft into low Earth orbit. His research work focuses on precise orbit and clock determination as well as geodetic and atmospheric applications of GNSS. Previously, at the Jet Propulsion Laboratory, he was as an analyst and developer for a variety of precise GNSS processing systems. He received his B.S. in Physics from Creighton University and Ph.D. in Aerospace Engineering Sciences from the University of Colorado.

This presentation covers several topics related to GNSS radio occultation. We begin with background on the computation of bending angle and refractivity profiles from GNSS measurements taken in low Earth orbit (LEO), as well as derived atmospheric products (e.g. temperature, pressure, humidity) used by global weather centers. We review the status of existing LEO radio occultation satellites, including COSMIC-1, KOMPSAT-5, MetOp, and other missions of opportunity. We highlight science impacts in the areas of numerical weather prediction, forecasting cyclone genesis, and space weather. Finally, we look ahead to the upcoming six satellite COSMIC-2 constellation.