

# ChEGSA

Texas A&M University



CHEMICAL  
ENGINEERING

## Chemical Engineering Graduate Student Association 8<sup>th</sup> Annual Research Symposium

11<sup>th</sup> March 2021



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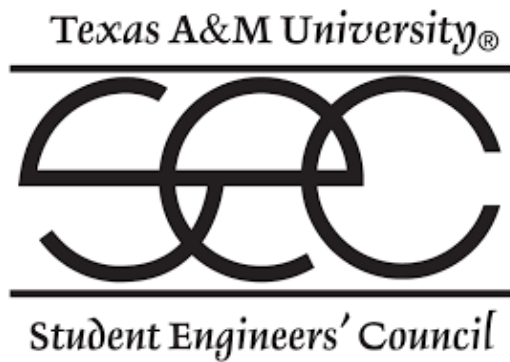
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**Our Platinum Sponsors**

**KRATON**



**KANEXKA**

# Welcome

The Chemical Engineering Graduate Student Association at Texas A&M University would like welcome you to the 8<sup>th</sup> Annual Research Symposium. The event will showcase cutting edge research being conducted in our department, while also providing students with the space to interact with industry and academia. In the 8<sup>th</sup> edition of this event, we hope to grow upon the strong relationship the department has fostered with our partners over the years. We gratefully acknowledge the sponsorship provided by Kraton, Kaneka Corporation, and Student Engineers' Council. Lastly, we want to thank you, the attendee, for supporting us over the years and making this event happen in an especially challenging time.

## Our Advisory Committee

**Prof. Micah Green**

*Director, Graduate Program  
Primary Advisor to ChEGSA*

**Prof. Arul Jayaraman**

*Department Head*

## The ChEGSA Team

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*Symposium Committee*

## Contact Us

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# Symposium Schedule

Date: March 11, 2021

Zoom Link: <https://tamu.zoom.us/j/93412599723>

Time	Event
9:30 AM - 9:40 AM	<b>Welcome Address</b>
9:45 AM - 10:00 AM	Copper oxide passivation effect on electromigration of plasma etched copper lines <b>Jia Quan Su</b>
10:00 AM - 10:15 AM	Curing and printing of thermosetting resins using localized radio-frequency heating <b>Anubhav Sarmah</b>
10:15 AM - 10:30 AM	Methane dehydroaromatization over Mo/ZSM-5: Effect of introducing molecules through different feeding modes <b>Nagat Elrefaei</b>
10:30 AM - 10:45 AM	A computational approach to characterize formation of a passivation layer in Lithium metal anodes <b>Niranjan Sitapure</b>
10:45 AM - 11:00 AM	Laser-induced silicon carbide coatings and composites <b>Muhammad Anas</b>
11:00 AM - 11:15 PM	Swift solution combustion synthesis of novel sulfur and boron codoped cobaltiron oxyhydroxides electrocatalysts for saline water oxidation <b>Ahmed Badreldin</b>
11:15 PM - 11:30 PM	Natural selection imposed by mechanical properties of a biomaterial results in novel cellular phenotypes <b>Purboja Purkayastha</b>
11:30 PM - 11:45 PM	Structural lithium-ion battery cathodes based on organic redox active polymers and Kevlar aramid nanofibers <b>Suyash Oka</b>
11:45 PM - 12:45 PM	<b>Lunch Break</b>

**Advanced Materials and Catalysis**

**Safety Engineering**

**Process Systems Engineering**

<b>Time</b>	<b>Event</b>
12:45 PM - 1:20 PM	<i>Distinguished Lecture: Safety of Digital Process Systems</i> <b>Prof. Faisal I. Khan</b>
1:25 PM – 2:00 PM	<i>Distinguished Lecture: Flow Induced Crystallization Behavior of Linear Polymers in Uniaxial Extension</i> <b>Prof. Martin Sentmanat</b>
2:10 PM - 2:25 PM	Developing a CFD heat transfer model for applying high explosion foam in an LNG spill <b>Zhuoran Zhang</b>
2:25 PM - 2:40 PM	Risk-based fault prediction of chemical processes using operable adaptive sparse identification of systems (OASIS) <b>Bhavana Bhadriraju</b>
2:40 PM - 2:55 PM	Development of parametric reduced-order model for consequence estimation of rare events <b>Pallavi Kumari</b>
2:55 PM - 3:10 PM	Spatiotemporal control of gene expression boundaries using a feedforward loop <b>Prasad Bandodkar</b>
3:10 PM - 3:25 PM	Data-driven prescriptive maintenance: Integrated scheduling and explicit fault-tolerant multi-parametric control <b>Christopher Gordon</b>
3:25 PM - 3:40 PM	Smart Manufacturing for Monitoring and Control of an Industrial Air Separation Unit <b>Dustin Kenefake</b>
3:40 PM - 3:55 PM	Multiscale modeling and model predictive control of CsPbBr <sub>3</sub> quantum dots production: A step towards on-demand smart-nanomanufacturing <b>Niranjan Sitapure</b>
3:55 PM - 4:10 PM	Smaller than the unit cell: Smallest repeating units of Zeolite frameworks <b>Akhilesh Gandhi</b>

**Advanced Materials and Catalysis**

**Safety Engineering**

**Process Systems Engineering**

# Distinguished Lecture



**Prof. Faisal I. Khan**

## *Safety of Digital Process Systems*

Dr. Faisal Khan is the incoming Professor and Director of Mary Kay O'Connor Process Safety Center (MKOPSC). He is currently Professor and Canada Research Chair (Tier I) of Offshore Safety and Risk Engineering. He is the founder of the Centre for Risk Integrity and Safety and Engineering (C-RISE), which has over research 90 research members. His research interest areas include safety and risk engineering, inherent safety, and risk-based integrity assessment and management.

He is the recipient of the President Outstanding Research Award of 2012-13, CSChE National Award on Process Safety Management of 2014, President Outstanding

Research Supervision Award of 2013-14, and Society of Petroleum Engineer award for his contribution to Health, Safety and Risk Engineering (2015). He has authored over 500 research articles in peer-reviewed journals on safety, risk, and reliability engineering and seven books on the subject area. He is Editor-in-Chief to the Journal of Process Safety and Environmental Protection and Journal of Safety in Harsh Environments, and subject Editor/Editorial Board Members to other safety and risk journals.

He regularly offers training programs/workshops on safety and risk engineering in different places, including St John's, Chennai, Dubai, Beijing, Aberdeen, Cape Town, Doha and Kuala Lumpur.

# Distinguished Lecture



**Prof. Martin Sentmanat**

***Flow Induced Crystallization  
behaviour of Linear Polymers  
in Uniaxial Extension***

Dr. Sentmanat received his B.S. (1990) in Mechanical Engineering from Texas A&M University in College Station, TX, and then headed north to Montreal, Canada where he received his Masters (1992) and Ph.D. (1995) in Chemical Engineering from McGill University under the supervision of noted rheologist Prof. John M. Dealy. Dr. Sentmanat began working as a Senior Research Physicist at The Goodyear Tire & Rubber Company at Corporate Research in Akron, OH in 1995, and after authoring more than two dozen worldwide patents left Goodyear at the end of 2003 to found Xpansion Instruments, exclusive manufacturer of his invention, the SER Universal Testing Platform, which has served to redefine the paradigm in experimental extensional rheology and miniature-scale materials testing. After almost two decades of providing his services as a professional consultant and an expert witness, Dr. Sentmanat joined the faculty of the Department of Chemical Engineering at Texas A&M University in January of 2020.