

# 6<sup>th</sup> Coastal Bend Mathematics & Statistics Conference

Online Virtual Conference

Saturday April 09, 2022: 8:30AM - 5:30PM

Department of Mathematics & Statistics  
Texas A&M University - Corpus Christi



## *Conference Schedule*

### Organizers:

Dr. D. Palaniappan

Dr. S. M. Mallikarjunaiah

Dr. K. Gajamannage

Dr. M. Vasilyeva

## Conference Inauguration

Saturday April 09, 2022: 8:30AM - 8:50AM

ZOOM ID: 936 6548 2352 PASSCODE: 6thCBMSC

**Introduction:** Prof. D. Palaniappan  
Department of Mathematics & Statistics

**Inaugural Address:** Dr. A. Mahdy  
Vice President for Research and Innovation  
Interim Dean of the College of Science & Engineering

**Vote of Thanks:** Prof. A. Sadovski  
Department Chair

Morning Session: 9:00AM to 12:30PM

- **Parallel Session-I**
- **Session Chair:** Dr. M. Vasilyeva
- **ZOOM ID:** 967 5888 9623     **PASSCODE:** M32yNT

1. 9:00AM - 9:25AM

**Yalchin Efendiev** (efendiev@math.tamu.edu )

*Modeling subgrid effects and temporal splitting in machine learning*

2. 9:30AM - 9:55AM

**Eric T. Chung** (tschung@math.cuhk.edu.hk )

*The CEM-GMsFEM and its applications*

3. 10:00AM - 10:25AM

**Yating Wang** (yatingwang@maths.hku.hk )

*Multirate partially explicit scheme for multiscale flow problems*

4. 10:30AM - 10:55AM

**Loic Cappanera** (lmcappan@central.uh.edu )

*Artificial compressibility and projection methods for incompressible multiphase flows*

5. 11:00AM - 11:25AM

**Samuel Fagbemi** (sfagbemi@uwyo.edu )

*Multi-scale hydro-mechanical interactions in fluid-bearing sedimentary rocks*

6. 11:30AM - 11:55AM

**Giselle Sosa Jones** (ggsosajo@central.uh.edu )

*A sequential discontinuous Galerkin method for three-phase flows in porous media*

Morning Session: 9:00AM to 12:30PM

- **Parallel Session-II**
- **Session Chairs:** Dr. Z. Qiao and Dr. A. Balogh
- **ZOOM ID:** 922 9414 5013     **Passcode:** iVku53

1. 9:00AM - 9:25AM

**Zhijun Qiao** (zhijun.qiao@utrgv.edu )

*Integrable fifth-order CH equation with pseudo-peakons*

2. 9:30AM - 9:55AM

**Bao-Feng Feng** (baofeng.feng@utrgv.edu )

*Unified method to construct dark, breather and rogue wave solutions to the nonlinear Schrodinger equation*

3. 10:00AM - 10:25AM

**Archana M. A., Sumithra R., Deepa R. Archana** (archanamurthy78@gmail.com )

*Effects of uniform and non-uniform temperature gradients on Rayleigh-Bénard convection in a composite system with constant heat sources*

4. 10:30AM - 10:55AM

**Veena B. N.** (mvymath@gmail.com )

*Need for local thermal non equilibrium effects for the study of natural convection in nanoliquid-saturated low porosity enclosures*

5. 11:00AM - 11:25AM

**Jayaprakash M. C** (jayaprakashmc@gmail.com )

*Effect of thermal radiation on two phase dusty fluid flow over a stretching rotating disk with convective boundary condition*

6. 11:30AM - 11:55AM

**M. A. Khanday** (khanday@uok.edu.in )

*Mathematical modeling of human physiology through partial differential equations*

7. 12:00PM - 12:25PM

**Babitha A.** (babithaatiwale16@gmail.com)

*Computational study on heat transfer and MHD electrified flow of Maxwell nanofluids with fractional derivative*

Morning Session: 9:00AM to 12:30PM

- **Parallel Session-III**

- **Session Chair:** Dr. A. Sadovski
- **ZOOM ID:** 953 3615 4909 **Passcode:** PtWYh3

1. 9:00AM - 9:25AM

**Zhaosheng Feng** (zhaosheng.feng@utrgv.edu)

*Diffusional systems of infection process: analysis and simulation*

2. 9:30AM - 9:55AM

**A. Lourdusam, I. Dhivviyanandam, S. Kither Iamma** (divyanasj@gmail.com)

*Pebbling number and  $t$ -pebbling number for the deleted independent edges of middle graphs of  $F_n^{-f}$*

3. 10:00AM - 10:25AM

**Komala B. Sumithra R.** (komala550@gmail.com)

*Triple diffusive magneto convection in a composite system*

4. 10:30AM - 10:55AM

**Ruwaidiah Idris, Nur Zuliana Zulkifli** (ruwaidiah@umt.edu.my)

*Bifurcation diagram for the effect of rotation on chaotic convection in porous media*

5. 11:00AM - 11:25AM

**Keerthana S., P. G. Siddheshwar, Sameena Tarannum, Ruwaidiah Idris**

(keerthana.s@res.christuniversity.in)

*Rayleigh-Bénard convection in a Casson fluid with weak vertical harmonic oscillations: Linear and non-linear analyses*

6. :11:30AM - 11:55AM

**Richa Saha, Mahesha Narayana, Pradeep G. Siddheshwar, Smita S. Nagouda**

(richa.saha@res.christuniversity.in)

*Thermo-convective flows of a water-copper nanofluid over three different horizontal undulated surfaces in a porous medium*

7. 12:00PM - 12:25PM

**Noor Arshika S., P. G. Siddheshwar, Sameena Tarannum**

(noor.arshika@res.christuniversity.in)

*Study of Rayleigh-Bénard regular and chaotic convection using rigid-rigid, rigid-free, and free-free isothermal boundaries*

Morning Session: 9:00AM to 12:30PM

- **Parallel Session-IV**
- **Session Chair:** Dr. K. Gajamannage
- **ZOOM ID:** 931 6668 5478 **Passcode:** april9

1. 9:00AM - 9:25AM

**Zheyi Qin, Shashika Muramudalige, Anura Jayasumana**

(anura.jayasumana@colostate.edu)

*Image in-painting using auto-encoders - a novel approach*

2. 9:30AM - 9:55AM

**Lei Jin** (lei.jin@tamucc.edu)

*Comparing series via quantile periodograms*

3. 10:00AM - 10:25AM

**Lakshmi K. M.** (kmlakshmi@academicos.uta.cl)

*Natural convection of a binary liquid in cylindrical porous annuli/rectangular porous enclosures with Dufour and Soret effects using two-temperature Model*

4. 10:30AM - 10:55AM

**T. Arul Selvamary, Sumithra R.** (arulthomasjt@gmail.com)

*The onset of double diffusive Darcy Rayleigh Bénard convection in a composite system saturated with couple stress fluid-saturated porous medium*

5. 11:00AM - 11:25AM

**Christy Rani, K. G. Priscilla Pacifica** (christy.agnes@gmail.com)

*The total outer connected detour number of a graph*

6. 11:30AM - 11:55AM

**Shyamala V., Sumithra R.** (svr02009@gmail.com)

*Onset of Rayleigh-Bénard-Marangoni convection influenced by Local Thermal Non-Equilibrium (LTNE) in a composite layer with respect to Darcy model*

7. 12:00PM - 12:25PM

**Kanchana C.** (ckanchana@academicos.uta.cl)

*Linear and weakly/local nonlinear stability analyses of Rayleigh-Bénard convection in a chemically reactive two-component fluid*

**Afternoon Session: 1:30PM to 5:30PM**

- **Parallel Session-I**
- **Session Chair:** Dr. M. Vasilyeva
- **ZOOM ID:** 967 5888 9623     **PASSCODE:** M32yNT

1. 1:30PM - 1:55PM

**Xianping Li** (Xianping.Li@asu.edu )

*Discrete maximum principle for moving mesh Streamline Upwind Petrov-Galerkin method for  $\gamma$ -dependent anisotropic convection-diffusion problems*

2. 2:00PM - 2:25PM

**Siu Wun Cheung** (cheung26@llnl.gov)

*Reduced-order modeling for hydrodynamics simulation of the Rayleigh–Taylor instability*

3. 2:30PM - 2:55PM

**Shubin Fu** (sfu45@math.wisc.edu)

*An efficient and statistically accurate Lagrangian data assimilation algorithm with applications to discrete element sea ice models*

4. 3:00PM - 3:25PM

**Sergei Stepanov** (cepe2a@inbox.ru)

*Multiscale modeling of heat and mass transfer problems in permafrost area*

5. 3:30PM - 3:55PM

**Youwen Wang** (ywang23@islander.tamucc.edu)

*Numerical solution and factor analysis of the spatial-temporal systems of multi-species interactions*

6. 4:00PM - 4:25PM

**Stephen Henry** (shenry1@islander.tamucc.edu)

*Finite element simulation of the population distribution in heterogenous domain*

7. 4:30PM - 4:55PM

**Manjunatha N. and Sumithra R.** (manjumscmphil@gmail.com)

*Influence of temperature profiles and heat source/sink in a combined layer on double component magneto-convection*

8. 5:00PM - 5:25PM

**Davita Devi Soibam, P.G. Siddheshwar** (davitadevi.soibam@res.christuniversity.in)

*Weakly nonlinear analysis of Darcy Bénard convective instability in a horizontal porous layer with local thermal equilibrium: Effects of free surface and convective boundary condition*

**Afternoon Session: 1:30PM to 5:30PM**

- **Parallel Session-II**
- **Session Chairs:** Dr. D. Bhatta & Dr. L. Zuo
- **ZOOM ID:** 922 9414 5013     **Passcode:** iVku53

1. 1:30PM - 1:55PM

**Dambaru Bhatta** (dambaru.bhatta@utrgv.edu)

*Hydro-thermal convective flow in porous media in presence of a solute*

2. 2:00PM - 2:25PM

**Andras Balogh, Camille Vasquez** (andras.balogh@utrgv.edu)

*Boundary feedback control of the 3D Navier-Stokes equations*

3. 2:30PM - 2:55PM

**C. Siddabasappa, S. M. Mallikarjunaiah, D. Palaniappan**

(siddabasappa.channabasappa@tamucc.edu)

*Classical Rayleigh-Bénard convection problem revisited*

4. 3:00PM - 3:25PM

**Jose A. Morales E.** (jose.morales4@utsa.edu)

*Inverse problems in electrochemistry*

5. 3:30PM - 3:55PM

**Lihua Zuo** (lihua.zuo@tamuk.edu)

*Continuous streamline trajectories on complex grids*

6. 4:00PM - 4:25PM

**Meenakshi N.** (meenakshi.nerolu@gmail.com)

*Three mechanisms of externally controlling Rayleigh-Bénard convection in Newtonian nanoliquids*

7. 4:30PM - 4:55PM

**Mahanthesh Basavarajappa, Dambaru Bhatta** (mahanthesh.b@utrgv.edu)

*Thermodynamics of a molten polymer conveying nanoparticles in a wire coating process*

8. 5:00PM - 5:25PM

**Heena Firdose, P. G. Siddheshwar, Ruwaidiah Idris** (heena.firdose@res.christuniversity.in)

*Rayleigh-Bénard convection in a hybrid nanofluid with general boundary condition*



**Afternoon Session: 1:30PM to 5:30PM**

- **Parallel Session-III**
- **Session Chair:** Dr. G. Tintera
- **ZOOM ID:** 995 2949 0543     **PASSCODE:** cxQy46

1. 1:30PM - 1:55PM

**George Tintera, Ping Tintera** (george.tintera@tamucc.edu)

*Accumulation of rates can define integrals for business calculus students*

2. 2:00PM - 2:25PM

**Aden Ahmed** (aden.ahmed@tamuk.edu)

*Game extensions, Nash equilibria, and the two-player, two-strategy game of firms*

3. 2:30PM - 2:55PM

**Diane Denny** (diane.denny@tamucc.edu)

*Existence of a solution to partial differential equations with data at a given point in the spatial domain*

4. 3:00PM - 3:25PM

**Ogla Lopez** (ogla.lopez01@utrgv.edu)

*Optimal quantization for mixed distributions generated by two uniform distributions*

5. 3:30PM - 3:55PM

**Kavya Pushadapu, Sarjinder Singh** (kavya.pushadapu@students.tamuk.edu)

*Compromising between multiple sensitive characteristics (CBMSC) responses*

6. 4:00PM - 4:25PM

**Andras Balogh, Raven Ruiz** (andras.balogh@utrgv.edu)

*A GPU accelerated genetic algorithm for the construction of Hadamard matrices*

7. 4:30PM - 4:55PM

**Hansapani Rodrigo** (hansapani.rodrigo@utrgv.edu)

*Explainable artificial intelligence for assessing impact of internet-based cognitive behavioral therapy for Tinnitus*

8. 5:00PM - 5:25PM

**Alshad K. B.** (alshadkb@gmail.com)

*Half circular dagum distribution and its applications*

Afternoon Session: 1:30PM to 5:30PM

- **Parallel Session-IV**
  - **Session Chair:** Dr. K. Gajamannage
  - **ZOOM ID:** 931 6668 5478 **Passcode:** april9
1. 1:30PM - 1:55PM  
**Suvra Pal** (suvra.pal@uta.edu)  
*A new machine learning-based cure rate model*
  2. 2:00PM - 2:25PM  
**Buddika Peiris** (tbpeiris@wpi.edu)  
*Synthesizing ROC curves*
  3. 2:30PM - 2:55PM  
**Yonggi Park, Kelum Gajamannage**  
(yonggi.park@tamucc.edu)  
*Recurrent neural networks for dynamical systems: Applications to ordinary differential equations, collective motion, and hydrological modeling*
  4. 3:00PM - 3:25PM  
**Ranran Chen, Min Wang** (ranran.chen@utsa.edu)  
*Bayesian adaptive LASSO quantile regression with missing response and Its applications*
  5. 3:30PM - 3:55PM  
**Andrea Bennett, Min Wang** (andreabennett1025@gmail.com)  
*An expectation-maximization algorithm for estimating the parameters of the correlated binomial distribution*
  6. 4:00PM - 4:25PM  
**Stephanie Flores** (stephanie.flores01@utrgv.edu)  
*Neural networks and partial differential equations*
  7. 4:30PM - 4:55PM  
**Shuxia (Susan) Li** (shuxia.li@utrgv.edu)  
*Commutator representations for a hierarchy of integrable equations*
  8. 5:00PM - 5:25PM  
**Bhavya Shivaraj** (bhavyashivaraj@gmail.com)  
*Effects of temperature modulation and variable viscosity on the onset of Rayleigh-Bénard electroconvection in a Newtonian liquid*

**Afternoon Session: 1:00PM to 5:30PM**

- **Parallel Session-V**
  - **Session Chairs:** Dr. S. M. Mallikarjunaiah
  - **ZOOM ID:** 975 8419 5894 **Passcode:** m3Hdr8
1. 1:00PM - 1:25PM  
**Sameena Tarannum, Noor Arshika**  
(sameena.tarannum@christuniversity.in)  
*Trigonometric cosine, square, sawtooth and triangular waveforms of internal, hearing modulations for three-component convection in a couple stress liquid*
  2. 1:30PM - 1:55PM  
**Amerika Kohne Sanchez, B. Veena Shankara Narayana Rao**  
(akohnesanchez@islander.tamucc.edu)  
*Can a would-be predator itself become a prey?*
  3. 2:00PM - 2:25PM  
**Mariah Trigo, B. Veena Shankara Narayana Rao**  
(mtrigo@islander.tamucc.edu)  
*A study on effects of mountain lion predation on wild pigs*
  4. 2:30PM - 2:55PM  
**Mara Martinez, S. M. Mallikarjunaiah** (mmcguire4@islander.tamucc.edu)  
*Solving differential equations with the use of artificial neural networks*
  5. 3:00PM - 3:25PM  
**Pavithra. V., S. M. Mallikarjunaiah** (pvenkatachalapathy@islander.tamucc.edu)  
*A feed-forward neural network framework for the solution of linear and nonlinear ordinary differential equations*
  6. 3:30PM - 3:55PM  
**Shankar Narasimha, D. Palaniappan** (snarasimha@islander.tamucc.edu)  
*Propulsion speed and efficiency calculations for a spherical squirmer in micropolar fluid*
  7. 4:00PM - 4:25PM  
**Madison Riba, Lei Jin** (mriba@islander.tamucc.edu)  
*Time series analysis and seasonal decomposition modeling of sea surface temperature*
  8. 4:30PM - 4:55PM  
**Sumithra R., Deepa Acharya** (deeparacharya24@gmail.com)  
*Effects of uniform and non-uniform temperature gradients on Non-Darcian-Benard-Marangoni convection in a composite layer with temperature dependent heat sources/sinks*

9. 5:00PM - 5:25PM

**Reena Nandal, P.G. Siddheshwar** (reena.nandal@christuniversity.in)

*Linear and nonlinear stability analyses of Darcy-Bénard convection in a chemically reacting fluid-saturated porous medium*