



Conference on Mathematical & Computational Issues in the Geosciences

October 14–17, 2025

Louisiana State University, Baton Rouge, Louisiana, U.S.

Online Program and Mobile App

Attendees are encouraged to view the Online Program Schedule:

<https://www.siam.org/conferences-events/siam-conferences/g25/program/program-abstracts/>

The Mobile App and Online Program Schedule contain the most up-to-date information.
A searchable abstract document is also posted.

SIAM Events Mobile App



www.tripbuildermedia.com/apps/siam



Society for Industrial and
Applied Mathematics

3600 Market Street, 6th Floor
Philadelphia, PA 19104-2688 U.S.

Telephone: +1-215-382-9800

Conference E-mail: meetings@siam.org • Conference Web: <https://www.siam.org/conferences-events/>
Membership and Customer Service: (800) 447-7426 (U.S. & Canada) or +1-215-382-9800 (worldwide)

<https://www.siam.org/conferences/cm/conference/g25>

Monday, October 13**1:30 p.m. – 6:00 p.m.**

Optional tour: Atchafalaya Basin by Airboat.

(Ticket purchase required. See:

<https://commerce.cashnet.com/LSUSIAM>

for details).

2:30 p.m. – 5:00 p.m.Complimentary optional tour: ExxonMobil Refinery.
(RSVP required. See:<https://commerce.cashnet.com/LSUSIAM>

for details).

3:30 p.m. – 5:00 p.m.Complimentary optional tour: LSU Petroleum
Engineering Research, Training, & Testing
(PERTT) Lab. (RSVP required. See:<https://commerce.cashnet.com/LSUSIAM>

for details).

Tuesday, October 14**7:30 a.m. – 5:00 p.m.**

Registration

*East Lobby, 2nd floor***9:00 a.m. – 9:15 a.m.**

Welcome Remarks

*Royal Cotillion (Room 250), 2nd floor***9:15 a.m. – 10:00 a.m.****IP1** Towards a Digital Twin for Coastal Ocean
Modeling

Clint Dawson, University of Texas at Austin, U.S.

*Royal Cotillion (Room 250), 2nd floor***10:00 a.m. – 10:30 a.m.**

Coffee Break

*East Lobby, 2nd floor***10:30 a.m. – 12:10 p.m.****Concurrent Sessions****MS1** Machine Learning for Geosciences - Part I of
IV*Royal Cotillion (Room 250), 2nd floor***MS2** Overcoming Challenges of MultiphysicsSystems: Recent Method Development and Results -
Part I of II*Magnolia (Room 301), 3rd floor***MS4** Modeling and Simulation of Multi-PhysicsProcesses in Fractured/Faulted Subsurface
Formations - Part I of II*Vieux Carre (Room 325), 3rd floor***MS5** Mathematical Challenges in Upscaling

Hydrological and Biogeochemical Processes

*Capital Chamber (Room 329), 3rd floor***Tuesday, October 14****MS6** Pore-scale Modeling of Subsurface Flow and
Transport with Applications to Carbon and Energy
Storage - Part I of II*Castillian (Room 304), 3rd floor***MS7** Recent Advances in Seismic and Hyperspectral
Data Analysis*Red River (Room 323), 3rd floor***10:30 a.m. – 12:35 p.m.****MS3** Recent Advances in Robust Numerical
Methods for Shallow Water Flows*International (Room 303), 3rd floor***12:10 p.m. – 1:40 p.m.**

Lunch Break

1:40 p.m. – 2:25 p.m.**IP2** Structure Preservation in Data-driven Coarse-
graining: Emergent Dynamics in Machine Learning
Particle Models

Nat Trask, University of Pennsylvania, U.S.

*Royal Cotillion (Room 250), 2nd floor***2:25 p.m. – 2:55 p.m.**

Coffee Break

*East Lobby, 2nd floor***2:55 p.m. – 4:35 p.m.****Concurrent Sessions****MT1** GEOS Simulation Framework*International (Room 303), 3rd floor***MS8** Machine Learning for Geosciences - Part II of
IV*Royal Cotillion (Room 250), 2nd floor***MS9** Overcoming Challenges of MultiphysicsSystems: Recent Method Development and Results -
Part II of II*Magnolia (Room 301), 3rd floor***MS10** Modeling and Simulation of Multi-Physics
Processes in Fractured/Faulted Subsurface

Formations - Part II of II

*Vieux Carre (Room 325), 3rd floor***MS11** Large-Scale Aquifer Characterization
and Modeling: Data, Tools, Techniques, and
Applications*Capital Chamber (Room 329), 3rd floor***MS12** Pore-scale Modeling of Subsurface Flow and
Transport with Applications to Carbon and Energy
Storage - Part II of II*Castillian (Room 304), 3rd floor***MS13** Recent Advances in Immersed and Embedded
Methods*Red River (Room 323), 3rd floor***4:35 p.m. – 5:00 p.m.**

Intermission

Tuesday, October 14**5:00 p.m. – 7:00 p.m.**

Welcome Reception

Transportation will be provided via bus to and from
hotels. See Special Events page:[https://www.siam.org/conferences-events/siam-](https://www.siam.org/conferences-events/siam-conferences/g25/program/special-events/)
[conferences/g25/program/special-events/](https://www.siam.org/conferences-events/siam-conferences/g25/program/special-events/)

for details.

*LSU Center for River Studies at the Water Campus***Wednesday, October 15****7:30 a.m. – 4:00 p.m.**

Registration

*East Lobby, 2nd floor***8:00 a.m. – 8:10 a.m.**SIAG/GS Career and SIAG/GS Early Career Prize
Presentations*Royal Cotillion (Room 250), 2nd floor***8:10 a.m. – 8:55 a.m.****SP1** SIAM Activity Group on Geosciences Career
Prize Lecture - Interface-controlled Multi-field
Processes in Porous Media Coupled with Free Flow
– From Pore to REV Scale

Rainer Helmig, University of Stuttgart, Germany

*Royal Cotillion (Room 250), 2nd floor***8:55 a.m. – 9:25 a.m.****PP1** Coffee Break and Poster Session **Posters will
be on display during Wednesday coffee breaks***East Lobby, 2nd floor***9:25 a.m. – 11:05 a.m.****Concurrent Sessions****MS14** Machine Learning for Geosciences - Part III
of IV*Royal Cotillion (Room 250), 2nd floor***MS15** Data Assimilation: From Theory to Practice -
Part I of III*Magnolia (Room 301), 3rd floor***MS17** 2D-3D Multiphysics in Hydrological
Modeling - Part I of III*Vieux Carre (Room 325), 3rd floor***MS18** Recent Advances in Multiscale Model
Reduction - Part I of III*Capital Chamber (Room 329), 3rd floor***MS19** Advances in Riverine and Coastal
Hydrodynamic and Morphodynamic Modeling - Part
I of III*Red River (Room 323), 3rd floor***11:05 a.m. – 11:15 a.m.**

Intermission

Wednesday, October 15**11:15 a.m. – 12:00 p.m.**

SP2 SIAM Activity Group on Geosciences Early Career Prize Lecture - Iterative Coupling Methods for Poroelasticity: From Design to Analysis through a Unified Thermodynamical Approach
Jakub W. Both, University of Bergen, Norway
Royal Cotillion (Room 250), 2nd floor

12:00 p.m. – 1:30 p.m.

Lunch Break

1:30 p.m. – 3:10 p.m.**Concurrent Sessions**

MS20 Machine Learning for Geosciences - Part IV of IV

Royal Cotillion (Room 250), 2nd floor

MS21 Data Assimilation: From Theory to Practice - Part II of III

Magnolia (Room 301), 3rd floor

MS22 **CANCELED** Coastal Waves, Smoothed Particle Hydrodynamics, Fluid Structures

MS23 2D-3D Multiphysics in Hydrological Modeling - Part II of III

Vieux Carre (Room 325), 3rd floor

MS24 Recent Advances in Multiscale Model Reduction - Part II of III

Capital Chamber (Room 329), 3rd floor

MS25 Evolving Porous Media: Application, Homogenization, and Numerical Methods

Castillian (Room 304), 3rd floor

MS26 Advances in Riverine and Coastal Hydrodynamic and Morphodynamic Modeling - Part II of III

*Red River (Room 323), 3rd floor***3:10 p.m. – 3:40 p.m.**

PP1 Coffee Break and Poster Session **Posters will be on display during Wednesday coffee breaks**
East Lobby, 2nd floor

3:40 p.m. – 5:20 p.m.**Concurrent Sessions**

MT2 PETSc the Portable Extensible Toolkit for Scientific Computation

Castillian (Room 304), 3rd floor

MS27 The 11th Society of Petroleum Engineers Comparative Solution Project

Royal Cotillion (Room 250), 2nd floor

MS28 Data Assimilation: From Theory to Practice - Part III of III

Magnolia (Room 301), 3rd floor

MS29 **CANCELED** Coastal Waves, Smoothed Particle Hydrodynamics, Fluid Structures Interaction - Part III of III

MS30 2D-3D Multiphysics in Hydrological Modeling - Part III of III

*Vieux Carre (Room 325), 3rd floor***Wednesday, October 15**

MS31 Recent Advances in Multiscale Model Reduction - Part III of III

Capital Chamber (Room 329), 3rd floor

MS32 Advances in Riverine and Coastal Hydrodynamic and Morphodynamic Modeling - Part III of III

*Red River (Room 323), 3rd floor***5:20 p.m. – 5:30 p.m.**

Intermission

5:30 p.m. – 6:30 p.m.

SIAG/GS Business Meeting *Complimentary beer and wine will be served.*

*Royal Cotillion (Room 250), 2nd floor***Thursday, October 16****7:30 a.m. – 3:00 p.m.**

Registration

*East Lobby, 2nd floor***8:00 a.m. – 8:05 a.m.**

Remarks

*Royal Cotillion (Room 250), 2nd floor***8:05 a.m. – 8:50 a.m.**

IP3 Simulating Our Way to CO2 Storage at Climate-relevant Scales

Sarah Gasda, NORCE Norwegian Research Centre, Norway

*Royal Cotillion (Room 250), 2nd floor***8:50 a.m. – 9:20 a.m.**

Coffee Break

*East Lobby, 2nd floor***9:20 a.m. – 11:00 a.m.****Concurrent Sessions**

MS33 Multi-physics Reservoir Simulation of Subsurface Storage Operations - Part I of II

Royal Cotillion (Room 250), 2nd floor

MS34 Numerical Methods for Enabling Real Time Digital Twins - Part I of II

Magnolia (Room 301), 3rd floor

MS35 The Role of Open Source Multiphysics Simulators for Subsurface Applications - Part I of II

International (Room 303), 3rd floor

MS36 Accelerating Restoration With Finance: Model Advancements and Applications

Vieux Carre (Room 325), 3rd floor

MS37 Polytopal Methods for Modeling Flows and Deformations in Porous Media - Part I of II
Capital Chamber (Room 329), 3rd floor

Thursday, October 16

MS38 Numerical Methods for Coupled Processes in Fractured Media

Castillian (Room 304), 3rd floor

MS39 Digital Twins of Subsidence in Coastal Louisiana

*Red River (Room 323), 3rd floor***11:00 a.m. – 11:15 a.m.**

Intermission

11:15 a.m. – 12:00 p.m.

IP4 The Mathematics of Sustainability
Simon Levin, Princeton University, U.S.
Royal Cotillion (Room 250), 2nd floor

12:00 p.m. – 1:30 p.m.

Lunch Break

1:30 p.m. – 3:10 p.m.**Concurrent Sessions**

MS40 Multi-physics Reservoir Simulation of Subsurface Storage Operations - Part II of II

Royal Cotillion (Room 250), 2nd floor

MS41 Numerical Methods for Enabling Real Time Digital Twins - Part II of II

Magnolia (Room 301), 3rd floor

MS42 The Role of Open Source Multiphysics Simulators for Subsurface Applications - Part II of II

International (Room 303), 3rd floor

MS43 Honoring a Pioneer: The Legacy of Professor Mary F. Wheeler in Computational Geosciences - Part I of II

Vieux Carre (Room 325), 3rd floor

MS44 Polytopal Methods for Modeling Flows and Deformations in Porous Media - Part II of II

Capital Chamber (Room 329), 3rd floor

MS45 Cryosphere and Environment: Computational, Stochastic, and Multiscale Models - Part I of II

*Castillian (Room 304), 3rd floor***3:10 p.m. – 3:40 p.m.**

Coffee Break

*East Lobby, 2nd floor***3:40 p.m. – 5:20 p.m.****Concurrent Sessions**

MT3 UM-Bridge (UQ and Modeling Bridge)
International (Room 303), 3rd floor

MS46 Honoring a Pioneer: The Legacy of Professor Mary F. Wheeler in Computational Geosciences - Part II of II

Vieux Carre (Room 325), 3rd floor

MS47 Surface Water/Groundwater Interactions
Capital Chamber (Room 329), 3rd floor

Thursday, October 16

Friday, October 17

MS48 Cryosphere and Environment:

Computational, Stochastic, and Multiscale Models - Part II of II

Castillian (Room 304), 3rd floor

CP1 Porous and Granular Process and Methods I

Royal Cotillion (Room 250), 2nd floor

CP2 Surface Processes and Methods I

Magnolia (Room 301), 3rd floor

CP6 Multiphysics and Surrogate Modeling

Red River (Room 323), 3rd floor

6:00 p.m. – 9:00 p.m.

Complimentary Conference banquet at the LSU Rural Life Museum with transportation provided. (RSVP required. See:

<https://commerce.cashnet.com/LSUSIAM> for details).

Friday, October 17

8:00 a.m. – 1:30 p.m.

Complimentary optional tour: Old River Control Structure. (Registration required and limited to U.S. citizens only. See:

<https://commerce.cashnet.com/LSUSIAM> for details).

8:30 a.m. – 2:00 p.m.

Registration

East Lobby, 2nd floor

9:00 a.m. – 9:45 a.m.

IP5 Numerical Simulation of Biot's Model by an Iterative Coupling Solution Method Based on an Oscillation-free Numerical Scheme

Carmen Rodrigo, Universidad de Zaragoza, Spain

Royal Cotillion (Room 250), 2nd floor

9:45 a.m. – 10:00 a.m.

Closing Remarks

Royal Cotillion (Room 250), 2nd floor

10:00 a.m. – 10:30 a.m.

Coffee Break

East Lobby, 2nd floor

10:30 a.m. – 12:10 p.m.

Concurrent Sessions

MS49 Uncertainty Quantification and Probabilistic Learning in Earth System Modeling - Part I of II

Magnolia (Room 301), 3rd floor

MS50 Advances in Preconditioning Techniques for Multiphysics Simulations in Geoscience - Part I of II

International (Room 303), 3rd floor

MS51 Advances in Efficient Computation and Compression of Large-Scale Geospatial Data

Vieux Carre (Room 325), 3rd floor

CP3 Scientific Machine Learning

Castillian (Room 304), 3rd floor

CP4 Porous and Granular Processes and Methods II

Red River (Room 323), 3rd floor

12:10 p.m. – 1:30 p.m.

Lunch Break

1:30 p.m. – 3:10 p.m.

Concurrent Sessions

MS16 Coastal Waves, Smoothed Particle

Hydrodynamics, Fluid Structures Interaction - Part I of III

Vieux Carre (Room 325), 3rd floor

MS53 Uncertainty Quantification and Probabilistic Learning in Earth System Modeling - Part II of II

Magnolia (Room 301), 3rd floor

MS54 Advances in Preconditioning Techniques for Multiphysics Simulations in Geoscience - Part II of II

International (Room 303), 3rd floor

CP5 Porous and Granular Processes and Methods III

Capital Chamber (Room 329), 3rd floor

CP7 Surface Processes and Methods II

Red River (Room 323), 3rd floor

1:30 p.m. – 3:35 p.m.

MS52 Modeling Organic Soil Dynamics

Castillian (Room 304), 3rd floor

1:30 p.m. – 6:00 p.m.

Optional tour: Atchafalaya Basin by Airboat. (Ticket purchase required. See:

<https://commerce.cashnet.com/LSUSIAM> for details).

3:45 p.m. – 5:00 p.m.

Complimentary optional tour: LSU Petroleum Engineering Research, Training, & Testing (PERTT) Lab. (RSVP required. See:

<https://commerce.cashnet.com/LSUSIAM> for details).

Abbreviation Key

CP = Contributed Presentation Session

IP = Invited Plenary Speaker

MS = Minisymposium

MT = Minitutorial

PP = Poster Session

SP = Special Lecture

Students:

Participate in Your Profession By Getting Involved with SIAM!



- Free and discounted memberships, conference registrations, and publications
- Free membership in two specialized activity groups—networks of professionals within applied math and computational science that organize conferences and newsletters, award prizes, and often post job and fellowship opportunities in the SIAM Engage Online Community
- Student travel awards to SIAM conferences
- Student chapters — get involved or start one at your school
- Publish in *SIAM Undergraduate Research Online* (SIURO) — share research and experience the journal review process
- Free resources about career options in applied math and computational science at siam.org/careers
- Career advice in *SIAM News*
- Prizes to award excellence
- Participate in Gene Golub SIAM Summer School (G2S3)



“SIAM is important because professional organizations are vital in bringing up students and early career scientists. Making connections and providing a coherent and consistent community that meets throughout the year is an invaluable thing. Publishing is important too, so SIAM journals are an excellent venue for in-depth work.”

— Jed Brown, SIAM Member, University of Colorado

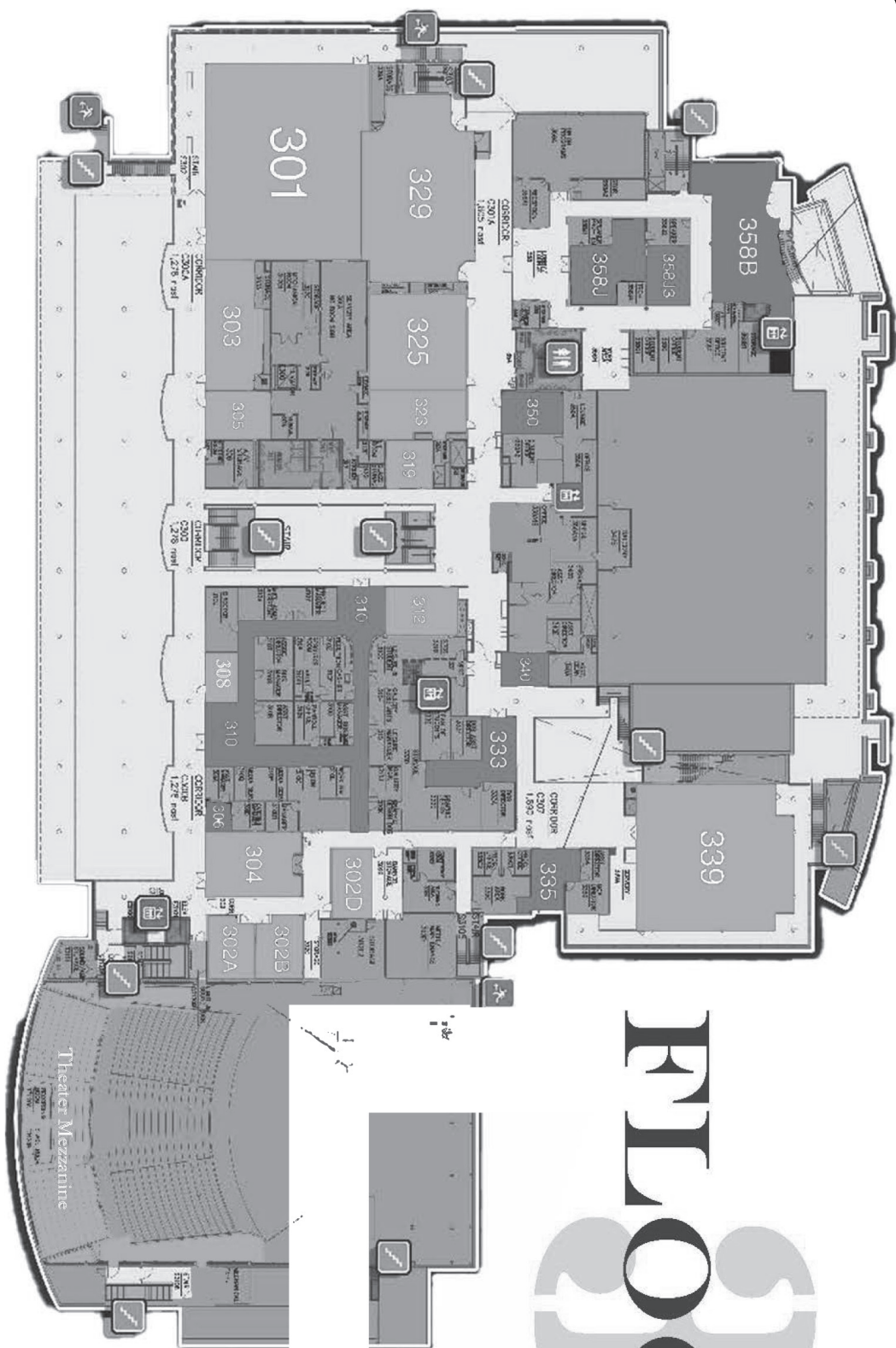


Take advantage of SIAM programs, resources, and opportunities for involvement! Learn more: siam.org/students



Society for Industrial and
Applied Mathematics

Louisiana State University Student Union Floor Plans



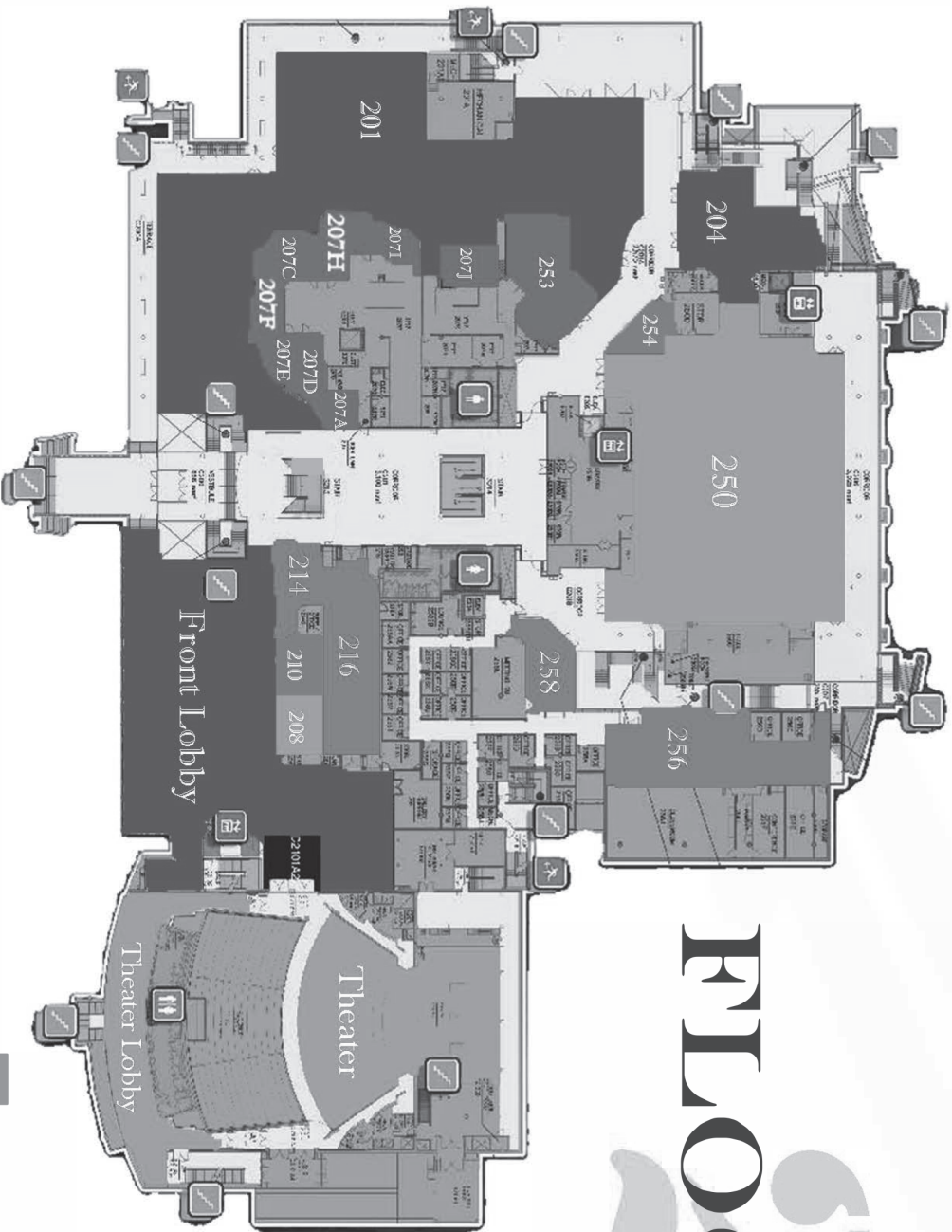
Meeting Spaces

- 301 Magnolia
- 303 International
- 304 Castilian
- 323 Red River
- 325 Vieux Carre
- 329 Capital Chamber

- Stairs
- Elevator
- Restrooms
- Emergency Exits

Louisiana State University Student Union Floor Plans

2nd FLOOR



Services

- 210 Interfaith Prayer & Meditation Room
- 254 Lactation Room

Meeting Spaces

- 250 Royal Corillion Ballroom

Food

- 207A CC's Coffee House
- 207D - 207E City Slice Pizza
- 207F Bon File'
- 207C Red Stick Subs
- 207H Smoothie King
- 207I Chick-fil-a
- 207J Panda Express
- 253 On the Geaux

Departments

- 214 Information Desk

- Stairs
- Elevator
- Restrooms
- Emergency Exits

To Our Conference Sponsor, *Thank You!*



To Our Funding Agency, *Thank You!*

SIAM and the Organizing Committee wish to extend their thanks and appreciation to the U.S. National Science Foundation for their support.

