

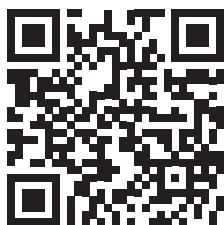
# At-A-Glance

## 2015 SIAM Conference on Applications of Dynamical Systems

Figure courtesy J. Meiss and D. Simpson, DSWeb media gallery.



**May 17-21, 2015**  
**Snowbird Ski and Summer Resort**  
**Snowbird, Utah, USA**



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# 2015 SIAM Conference on Applications of Dynamical Systems At-A-Glance

## Saturday, May 16

8:00 AM - 8:00 PM

Registration

Ballroom Foyer

9:00 AM - 8:30 PM

SIAM Workshop on Network Science

(May 16-17 -- separate fees apply)

Cottonwood Room - Snowbird Center

6:00 PM - 8:00 PM

Welcome Reception

Ballroom



## Sunday, May 17

8:00 AM - 5:00 PM

Registration

Ballroom Foyer

8:30 AM - 6:00 PM

SIAM Workshop on Network Science

(May 16-17 -- separate fees apply)

Cottonwood Room - Snowbird Center

9:00 AM - 11:00 AM

**Concurrent Sessions**

**MS1** Patterns in Partial Differential Equations - Part I of II

Ballroom I

**MS2** Dynamics of Boolean Switching Networks

Ballroom II

**MS3** Ocean-in-the-loop: Towards Real-Time Monitoring in Geophysical Flows - Part I of II

Ballroom III

**MS4** Dynamics of Rigid Bodies and Fluids

Magpie A

**MS5** See Monday 8:30 AM

**MS6** See Thursday 1:30 PM

**MS7** The Dynamics and Computation of Neuronal Networks

Wasatch B

**MS8** Wave-turbulence Interactions in Geophysical and Astrophysical Fluid Dynamics

Maybird

**MS9** Dynamics on Networks and Network Topology in Ecology and Epidemiology

Superior A

**MS10** Dynamics Modeling with Transformations Between Partial- and Delay Differential Equations

Superior B

**MS11** Multiscale Models to Understand the Social and Physical World - Part I of II

White Pine

## Sunday, May 17

**MS12** Network Synchronization in Mechanical Systems and Beyond - Part I of II

Primrose A

**MS13** Dynamics of High Dimensional Stochastic Models

Primrose B

**MS23** Oscillations in Systems with Relays

Magpie B

**MS116** Torus Canards in Applications

Wasatch A

11:00 AM - 11:30 AM

Coffee Break

Golden Cliff



11:30 AM - 11:45 AM

Welcome Remarks

Ballroom

11:45 AM - 12:30 PM

**IP1** Advances on the Control of Nonlinear Network Dynamics

Adilson E. Motter, Northwestern University, USA

Ballroom

12:30 PM - 2:00 PM

Lunch Break

Attendees on their own

2:00 PM - 4:00 PM

**Concurrent Sessions**

**MT1** Network Dynamics

Ballroom III

**MS14** Featured Minisymposium: Applications of Algebraic Topology to Neuroscience

Ballroom I

**MS15** Featured Minisymposium: Data Assimilation in the Life Sciences

Ballroom II

**MS16** Featured Minisymposium: Data-Driven Modeling of Dynamical Processes in Spatially-Embedded Random Networks

Maybird

**MS17** Featured Minisymposium: Stochastic Delayed Networks

Primrose A

**MS18** Featured Minisymposium: Localized Pattern Formation in Reaction-diffusion Equations

Primrose B

4:00 PM - 4:30 PM

Coffee Break

Golden Cliff



## Sunday, May 17

4:30 PM - 6:30 PM

**Concurrent Sessions**

**CP1** Topics in Reaction-Diffusion Systems

Ballroom I

**CP2** Topics in Pattern Formation I

Ballroom II

**CP3** Topics in Networks I

Ballroom III

**CP4** Topics in Computational Dynamical Systems I

Magpie A

**CP5** Topics in Biological Dynamics I

Magpie B

**CP6** Topics in Bifurcation Theory

Wasatch A

**CP7** Topics in Mechanical Systems

Wasatch B

**CP8** Topics in Biological Dynamics II

Maybird

**CP9** Non-smooth Dynamical Systems

Superior A

**CP10** Topics in Geometric and Nonlinear Dynamical Systems

Superior B

**CP11** Topics in Feedback/Control/Optimization I

White Pine

**CP12** Topics in Atmospheric/Climate Dynamics and Related Themes

Primrose A

**CP13** Topics in Nonlinear Oscillators

Primrose B

6:30 PM - 8:00 PM

Dinner Break

Attendees on their own

6:30 PM - 8:00 PM

DSWeb Editorial Board Meeting

Boardroom

8:00 PM - 8:15 PM

Prize Presentations -

Jürgen Moser and J. D. Crawford

Ballroom

8:15 PM - 9:00 PM

**SP1** Jürgen Moser Lecture - Dynamics and Data  
John Guckenheimer, Cornell University, USA

Ballroom

# 2015 SIAM Conference on Applications of Dynamical Systems At-A-Glance

**Monday, May 18**

**Monday, May 18**

**Monday, May 18**

**8:00 AM - 6:30 PM**

Registration  
*Ballroom Foyer*

**8:30 AM - 10:30 AM**

**Concurrent Sessions**

**MS5** Structural and Functional Network Dynamics and Inference

*Magpie B*

**MS19** Patterns in Partial Differential Equations - Part II of II

*Ballroom I*

**MS20** Structure-dynamics Relation in Networks of Coupled Dynamical Systems

*Ballroom II*

**MS21** Ocean-in-the-loop: Towards Real-Time Monitoring in Geophysical Flows - Part II of II

*Ballroom III*

**MS22** Geometric Mechanics and Applications

*Magpie A*

**MS23** See Sunday 9:00 AM

**MS24** Nontwist Hamiltonian systems: Theory and Applications

*Wasatch A*

**MS25** Rhythmic Dynamics of Minimal Neuronal Networks

*Wasatch B*

**MS26** Experiments on Transport in Multi-scale Fluid Systems

*Maybird*

**MS27** Analysis of Network Dynamical Systems

*Superior A*

**MS28** Simple Systems with Complex Dynamics

*Superior B*

**MS29** Multiscale Models to Understand the Social and Physical World - Part II of II

*White Pine*

**MS30** Network Synchronization in Mechanical Systems and Beyond - Part II of II

*Primrose A*

**MS31** Extreme Events: Modeling, Analysis, Prediction, and Control

*Primrose B*

**10:30 AM - 11:00 AM**

Coffee Break  
*Golden Cliff*



**11:00 AM - 11:45 AM**

**IP2** Mathematics of Crime

Andrea L. Bertozzi, University of California, Los Angeles, USA

*Ballroom*

**11:45 AM - 1:15 PM**

Lunch Break  
*Attendees on their own*

**1:15 PM - 3:15 PM**

**Concurrent Sessions**

**MS32** Energy Transfer and Harvesting in Nonlinear Systems - Part I of II

*Ballroom I*

**MS33** Rare Events in Stochastic Systems

*Ballroom II*

**MS34** Mathematical Models of Cancer Development and Treatment

*Ballroom III*

**MS35** Dynamics of Inertial Particles in Flows

*Magpie A*

**MS36** Theory and Applications of Nonsmooth Dynamics in Physical Systems - Part I of II

*Magpie B*

**MS37** Guided Approaches to Ocean Data Assimilation Incorporating Uncertainty and Observability

*Wasatch A*

**MS38** Spatial Organization of Biochemical Dynamics Within and Between Cells

*Wasatch B*

**MS39** Reduced Dynamical Models and Their Applications - Part I of II

*Maybird*

**MS40** The Behavior of Autonomous Agents in Diverse Applications

*Superior A*

**MS41** Renewable Energy and Power Grids: Their Mathematical Characterizations - Part I of II

*Superior B*

**MS42** Extensions and Applications of Dynamic Mode Decomposition - Part I of II

*White Pine*

**MS43** Applications of Exactly Solvable Chaos

*Primrose A*

**MS44** Recent Advances in Ergodic Theory with an Eye to Applications

*Primrose B*

**3:15 PM - 3:45 PM**

Coffee Break  
*Golden Cliff*



**3:45 PM - 5:45 PM**

**Concurrent Sessions**

**CP14** Topics in Fluids

*Ballroom I*

**CP15** Topics in Noisy/Stochastic/Random Dynamical Systems

*Ballroom II*

**CP16** Topics in Networks II

*Ballroom III*

**CP17** Topics in Computational Dynamical Systems II

*Magpie A*

**CP18** Topics in Complex Systems

*Magpie B*

**CP19** Topics in Classical Dynamical Systems

*Wasatch A*

**CP20** Topics in Computational Dynamical Systems & Pattern Formation

*Wasatch B*

**CP21** Topics in Biological Dynamics III

*Maybird*

**CP22** Delay Dynamical Systems & Time Series Analysis

*Superior A*

**CP23** Topics in Optical and Related Systems

*Superior B*

**CP24** Topics in Wave Dynamics

*Primrose A*

**CP25** Topics in Classical and Fluid Dynamical Systems

*Primrose B*

**5:45 PM - 6:00 PM**

Intermission

**6:00 PM - 6:45 PM**

**IP3** Filtering Partially Observed Chaotic Deterministic Dynamical Systems

Andrew Stuart, University of Warwick, United Kingdom

*Ballroom*

**6:45 PM - 7:00 PM**

Intermission

**7:00 PM - 8:00 PM**

**PD1** Journal Editors Panel and Reception (pizza and light refreshments available)

*Ballroom*



**8:30 PM - 9:30 PM**

SIAG/DS Business Meeting (complimentary beer and wine will be served)

*Ballroom*



# 2015 SIAM Conference on Applications of Dynamical Systems At-A-Glance

**Tuesday, May 19**

**8:00 AM - 4:30 PM**

Registration

*Ballroom Foyer*

**8:30 AM - 10:30 AM**

**Concurrent Sessions**

**MS45** Energy Transfer and Harvesting in Nonlinear Systems - Part II of II

*Ballroom I*

**MS46** Cellular Decision Making Under Noise  
*Ballroom II*

**MS47** Koopman Operator Techniques in Dynamical Systems: Theory and Practice - Part I of II

*Ballroom III*

**MS48** Bridging the Gap Between Observations and Idealized Modeling: A Comprehensive Approach to Weather and Climate Predictability  
*Magpie A*

**MS49** Theory and Applications of Nonsmooth Dynamics in Physical Systems - Part II of II

*Magpie B*

**MS50** Multistability in Biological Circuits: Theory and Applications

*Wasatch A*

**MS51** Mechanisms for Computations in Neuronal Networks

*Wasatch B*

**MS52** Reduced Dynamical Models and Their Applications - Part II of II

*Maybird*

**MS53** Ostwald Ripening, Aggregate Growth and Precipitation

*Superior A*

**MS54** Renewable Energy and Power Grids: Their Mathematical Characterizations - Part II of II

*Superior B*

**MS55** Extensions and Applications of Dynamic Mode Decomposition - Part II of II

*White Pine*

**MS56** Topology and Computation in Dynamics

*Primrose A*

**MS57** Chaos and Strange Attractors

*Primrose B*

**10:30 AM - 11:00 AM**

Coffee Break

*Golden Cliff*



**11:00 AM - 11:45 AM**

**IP4** Fields of Dreams: Modeling and Analysis of Large Scale Activity in the Brain

Bard Ermentrout, University of Pittsburgh, USA

*Ballroom*

**Tuesday, May 19**

**11:45 AM - 1:30 PM**

Lunch Break

*Attendees on their own*

**12:00 PM - 1:00 PM**

**PD2** Funding Agency Panel

*Ballroom*

**1:30 PM - 3:30 PM**

**Concurrent Sessions**

**MS58** Snapshot and Pullback Attractors, a Framework for Understanding Nonautonomous Dissipative Dynamics

*Ballroom I*

**MS59** Synchronization of Chaos and its Applications - Part I of II

*Ballroom II*

**MS60** Koopman Operator Techniques in Dynamical Systems: Theory and Practice - Part II of II

*Ballroom III*

**MS61** State and Parameter Estimation for Complex Dynamical Systems

*Magpie A*

**MS62** Dynamics of Nanoelectromechanical Systems (NEMS)

*Magpie B*

**MS63** Applications of Ensemble Data Assimilation Methods to Climate Processes  
*Wasatch A*

**MS64** Excitation Waves in Heterogeneous Cardiac Tissue: Theory and Experiments

*Wasatch B*

**MS65** Spiral and Scroll Waves Dynamics in Experiment and Simulations - Part I of II

*Maybird*

**MS66** Stochastic and Nonlinear Dynamics of Neuronal Networks - Part I of II

*Superior A*

**MS67** Evolutionary Dynamics and Constraints of Quickly Mutating Pathogens

*Superior B*

**MS68** The Structure and Dynamics of Multilayer Networks

*White Pine*

**MS69** Applications of Chaotic, Stochastic and Multiscale Dynamics

*Primrose A*

**MS70** Recent Applications of Singular Perturbation Theory - Part I of II

*Primrose B*

**3:30 PM - 4:00 PM**

Coffee Break

*Golden Cliff*



**Tuesday, May 19**

**4:00 PM - 6:00 PM**

**Concurrent Sessions**

**MS71** Emerging Collective Patterns in Dynamic Swarms

*Ballroom I*

**MS72** Synchronization of Chaos, Chimera and Neurosciences - Part II of II

*Ballroom II*

**MS73** Spiral and Scroll Waves Dynamics in Experiment and Simulations - Part II of II

*Maybird*

**MS74** Stochastic and Nonlinear Dynamics of Neuronal Networks - Part II of II

*Superior A*

**MS75** Between Order and Chaos: Entropy and Information Processing in Complex Dynamics

*Superior B*

**MS76** Networks of Chemical Oscillators

*Primrose A*

**MS77** Recent Applications of Singular Perturbation Theory - Part II of II

*Primrose B*

**MS97** Dynamical Models in Drug Delivery

*Ballroom III*

**CP26** Topics in Financial Dynamical Systems and Related Themes

*Magpie A*

**CP27** Topics in Biological Dynamics IV

*Magpie B*

**CP28** Topics in Feedback/Control/Optimization II

*Wasatch A*

**CP29** Topics in Pattern Formation II

*Wasatch B*

**6:00 PM - 8:30 PM**

Dinner Break

*Attendees on their own*

**6:30 PM - 8:30 PM**

SIADS Editorial Board Meeting

*Summit Room*

**8:30 PM - 10:30 PM**

**PP1** Poster Session and Dessert Reception

*Ballroom*



# 2015 SIAM Conference on Applications of Dynamical Systems At-A-Glance

## Wednesday, May 20

8:00 AM - 4:30 PM

Registration

*Ballroom Foyer*

8:30 AM - 10:30 AM

**Concurrent Sessions**

**MS78** Dynamics of Moreau Sweeping Processes - Part I of II

*Ballroom I*

**MS79** Topological Fluid and Mass Dynamics - Part I of II

*Ballroom II*

**MS80** Theoretical Aspects of Spiral and Scroll Wave Dynamics - Part I of II

*Ballroom III*

**MS81** First Passage Times in Discrete and Continuous Systems - Part I of II

*Magpie A*

**MS82** Control of Multiscale Dynamics - Part I of II

*Magpie B*

**MS83** Wave Propagation in Highly Nonlinear Dispersive Media - Part I of II

*Wasatch A*

**MS84** Dynamics of Neural Networks with General Connectivity and Nonlinearity

*Wasatch B*

**MS85** Advances in Viral Infection Modeling - Part I of II

*Maybird*

**MS86** Front Propagation in Advection-Reaction-Diffusion Systems - Part I of II

*Superior A*

**MS87** Nonsmooth Dynamical Systems: Theory and Applications - Part I of II

*Superior B*

**MS88** Emergent Phenomena from Many-player Dynamics in Biological and Social Systems

*White Pine*

**MS89** Complex Network Theory Based Approaches in the Analyses of Complex Systems and Data - Part I of II

*Primrose A*

**MS90** Sensitivity Methods with Applications

*Primrose B*

10:30 AM - 11:00 AM

Coffee Break

*Golden Cliff*



11:00 AM - 11:45 AM

**IP5** Cooperation, Cheating, and Collapse in Biological Populations

Jeff Gore, Massachusetts Institute of Technology, USA

*Ballroom*

## Wednesday, May 20

11:45 AM - 1:30 PM

Lunch Break

*Attendees on their own*

1:30 PM - 3:30 PM

**Concurrent Sessions**

**MS91** Dynamics of Moreau Sweeping Processes - Part II of II

*Ballroom I*

**MS92** Topological Fluid and Mass Dynamics - Part II of II

*Ballroom II*

**MS93** Theoretical Aspects of Spiral and Scroll Wave Dynamics - Part II of II

*Ballroom III*

**MS94** First Passage Times in Discrete and Continuous Systems - Part II of II

*Magpie A*

**MS95** Control of Multiscale Dynamics - Part II of II

*Magpie B*

**MS96** Wave Propagation in Highly Nonlinear Dispersive Media - Part II of II

*Wasatch A*

**MS97** See Tuesday 4:00 PM

**MS98** Advances in Viral Infection Modeling - Part II of II

*Maybird*

**MS99** Front Propagation in Advection-Reaction-Diffusion Systems - Part II of II

*Superior A*

**MS100** Nonsmooth Dynamical Systems: Theory and Applications - Part II of II

*Superior B*

**MS101** Models from Data

*White Pine*

**MS102** Complex Network Theory Based Approaches in the Analyses of Complex Systems and Data - Part II of II

*Primrose A*

**MS103** Transfer Operator Methods: Geometry, Continuous Time, Infinite Dimensions, Fast Computation

*Primrose B*

**MS119** From Singular Perturbation Theory to some Slow-Fast Systems: A Taste

*Wasatch B*

3:30 PM - 4:00 PM

Coffee Break

*Golden Cliff*



## Wednesday, May 20

4:00 PM - 6:00 PM

**Concurrent Sessions**

**MT2** Stochastic Dynamics of Rare Events

*Ballroom III*

**MS104** Featured Minisymposium: Non-Autonomous Instabilities

*Ballroom I*

**MS105** Featured Minisymposium: Random Walks, First Passage Time and Applications

*Ballroom II*

**MS106** Featured Minisymposium: Time-Delayed Feedback

*Wasatch B*

**MS107** Featured Minisymposium: Emerging Strategies for Stability Analysis of Electrical Power Grids

*Maybird*

**MS108** Featured Minisymposium: Invariant Manifolds Unravelling Complicated Dynamics

*Primrose A*

**MS109** Featured Minisymposium: Medical Applications

*Primrose B*

6:00 PM - 8:30 PM

Dinner Break

*Attendees on their own*

8:30 PM - 10:30 PM

**PP2** Poster Session and Dessert Reception

*Ballroom*



## Thursday, May 21

8:00 AM - 4:45 PM

Registration

*Ballroom Foyer*

8:30 AM - 10:30 AM

**Concurrent Sessions**

**MS110** Effective Multiscale Computational Modeling of Spatio-temporal Systems

*Ballroom I*

**MS111** Recent Insights into Controlling Flow Structures - Part I of II

*Ballroom II*

**MS112** Dynamical Systems Aspects of Legged Locomotion

*Ballroom III*



# 2015 SIAM Conference on Applications of Dynamical Systems At-A-Glance

Thursday, May 21

Thursday, May 21

**MS113** Statistical Physics and Nonlinear Dynamics for the Earth's Cryosphere

*Magpie A*

**MS114** Mathematical Modeling of Basal Ganglia

*Magpie B*

**MS115** Inverse Problems in Network Dynamics - Part I of II

*Wasatch A*

**MS116** See Sunday 9:00 AM

**MS117** Complex Collective Dynamics of Oscillator Networks - Part I of II

*Maybird*

**MS118** Recent Advances on Multiple Timescale Dynamics - Part I of II

*Superior A*

**MS119** See Wednesday 1:30 PM

**MS120** Stochastic Dynamics and Their Applications - Part I of II

*White Pine*

**MS121** Engineering Applications of Non-smooth Dynamics - Part I of II

*Primrose A*

**MS122** Nonlinear Waves in Coupled Systems - Part I of II

*Primrose B*

**10:30 AM - 11:00 AM**

Coffee Break

*Golden Cliff*



**11:00 AM - 11:15 AM**

Red Sock Award Announcements

*Ballroom*

**11:15 AM - 12:00 PM**

**IP6** Brain Control - It's Not Just for Mad Scientists

Jeff Moehlis, University of California, Santa Barbara, USA

*Ballroom*

**12:00 PM - 1:30 PM**

Lunch Break

*Attendees on their own*

**1:30 PM - 3:30 PM**

**Concurrent Sessions**

**MS6** Analysis, Modeling, and Forecasting in Biomedicine

*Magpie A*

**MS123** Spatio-temporal Patterns in Ecology

*Ballroom I*

**MS124** Recent Insights into Controlling Flow Structures - Part II of II

*Ballroom II*

**MS125** CANCELLED

**MS126** Voltage and Calcium Dynamics in Single Cells and Multicellular Systems

*Magpie B*

**MS127** Inverse Problems in Network Dynamics - Part II of II

*Wasatch A*

**MS128** Advances in Computer Assisted Proof for Infinite Dimensional Dynamical Systems

*Wasatch B*

**MS129** Complex Collective Dynamics of Oscillator Networks - Part II of II

*Maybird*

**MS130** Recent Advances on Multiple Timescale Dynamics - Part II of II

*Superior A*

**MS131** Uncertainty Propagation in High Dimensional Systems

*Superior B*

**MS132** Stochastic Dynamics and Their Applications - Part II of II

*White Pine*

**MS133** Engineering Applications of Non-smooth Dynamics - Part II of II

*Primrose A*

**MS134** Nonlinear Waves in Coupled Systems - Part II of II

*Primrose B*

**3:30 PM - 4:00 PM**

Coffee Break

*Golden Cliff*



**4:00 PM - 4:15 PM**

Closing Remarks

*Ballroom*

**4:15 PM - 5:00 PM**

**IP7** The Robotic Scientist: Distilling Natural Laws from Raw Data, from Robotics to Biology and Physics

Hod Lipson, Cornell University, USA

*Ballroom*

## Key to abbreviations and symbols



= Business Meeting



= Coffee Break

CP

= Contributed

IP

= Invited

MS

= Minisymposium

MT

= Minitutorial

PD

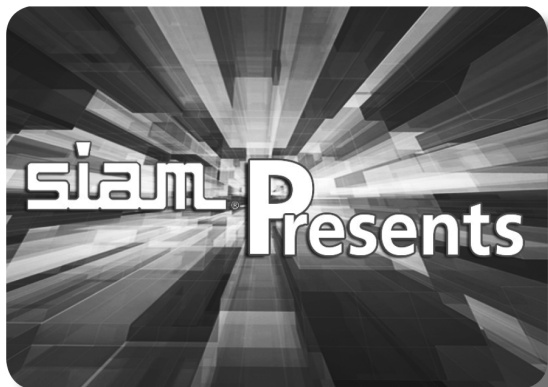
= Panel Discussion

PP

= Poster Session



= Refreshments Served



## SIAM Presents

An audio-visual archive, comprised of more than 1800 presentations posted in 28 searchable topics, including:

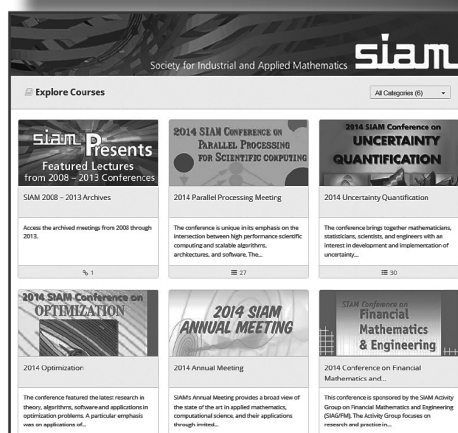
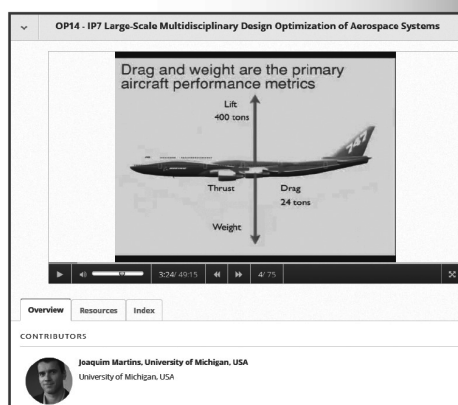
- algebraic geometry
- atmospheric and oceanographic science
- computational science
- data mining
- geophysical science
- optimization
- uncertainty quantification
- and more...

The collection, *Featured Lectures from our Archives*, includes audio and slides from 25 conferences since 2008, including talks by invited and prize speakers, select minisymposia, and minitutorials from the 2014 Annual Meeting and four 2014 SIAG meetings.

In addition, you can view brief video clips of speaker interviews and topic overviews from sessions at Annual Meetings starting in 2010, as well as the 2013 SIAM Conference on Computational Science and Engineering and the 2014 SIAM Conference on the Life Sciences.

Plans for adding more content from SIAM meetings abound, including presentations from six meetings in 2015.

**New presentations are posted every few months as the program expands with sessions from additional SIAM meetings. Users can search for presentations by category, speaker name, and/or keywords.**



The audio, slide, and video presentations are part of SIAM's outreach activities to increase the public's awareness of mathematics and computational science in the real world, and to bring attention to exciting and valuable work being done in the field. Funding from SIAM, the National Science Foundation, and the Department of Energy was used to support this project.

**[www.siam.org/meetings/presents.php](http://www.siam.org/meetings/presents.php)**

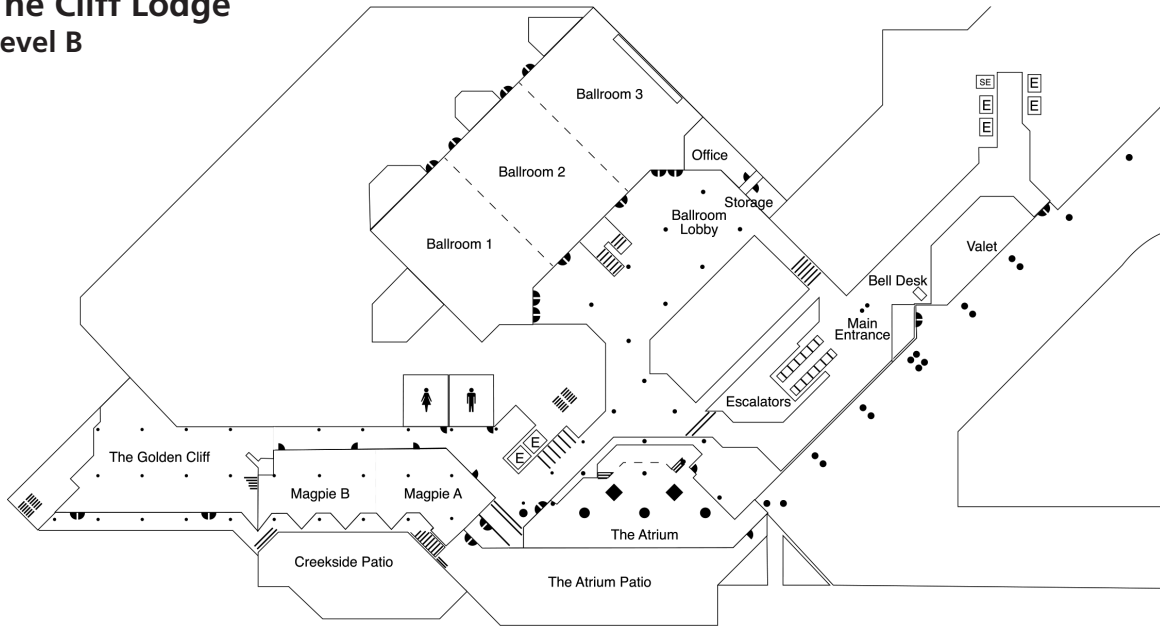


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# Snowbird Ski and Summer Resort, Cliff Lodge Floor Plans

Snowbird

## The Cliff Lodge Level B



Snowbird

## The Cliff Lodge Level C

