

American Society for Stereotactic
and Functional Neurosurgery

2018 | BIENNIAL MEETING

P R E L I M I N A R Y P R O G R A M

D E N V E R , C O L O R A D O

The Westin Denver Downtown • June 2-5, 2018



Jointly provided by the Congress of Neurological Surgeons and the
American Society for Stereotactic and Functional Neurosurgery



JOIN US IN DENVER, COLORADO!

The American Society for Stereotactic and Functional Neurosurgery is excited to invite you to the ASSFN 2018 Biennial Meeting, held June 2–5, 2018, in the mile-high city of Denver, Colorado. Functional Neurosurgery is rapidly evolving, and this evolution is not only being driven by neurosurgeons, but by engineers, neuroscientists, NIH, DARPA, and industry. To address this complex and growing field, our program this year includes leaders in the diverse arenas influencing the future of our specialty.

Join us as we welcome Honored Guest Dr. Philip A. Starr, the Dolores Cakebread Professor of Neurological Surgery, University of California San Francisco.

Plan to arrive on Saturday, June 2, for three pre-meeting special courses that help you stay on top of the rapidly changing business of health care; with sessions on integrating clinical science and clinical practice, incorporating new technologies into your practice, and finances, reimbursement, and CPT codes. Sunday's Opening Reception provides opportunities to connect with old and new friends alike while you enjoy delicious hors d'oeuvres and cocktails.

Daily plenary sessions explore thought-provoking topics with speakers working on the leading edge of technology. Discover the state of the BRAIN Initiative with a series of fascinating talks, and review the opportunities and challenges in the expanding reach of functional neurosurgery with the SPARC initiative. Explore the ethical implications of neuromodulation and neuroprosthetics, including the ethics of patenting regions of the brain, whether DBS and ECoG are safe and appropriate tools for exploring new therapies, and the ethics of neuroaugmentation.

Breakfast seminars start your day, and industry-sponsored lunches provide more opportunities for learning. Be sure to catch the best original science at the Poster Session with Wine and Cheese. Parallel Sessions allow you to tailor your meeting experience, with topics on network modulation and connectomics, pain, epilepsy, and radiosurgery. Be sure to visit our Exhibit Hall to see the latest and greatest in technology and connect with your corporate contacts.

The Westin Denver Downtown, set in the heart of the city, showcases exceptional views of the Rocky Mountains, and has a rooftop pool and fitness center. Enjoy Denver's booming dining scene, and be sure to take some time to explore Larimer Square, the Downtown Aquarium, and the Denver Center for Performing Arts.

The ASSFN 2018 Biennial Meeting is an unparalleled opportunity to stay on the leading edge of functional and stereotactic neurosurgery, and collaborate with colleagues and acclaimed faculty from across the globe, all while enjoying the beauty of Denver!

Make your arrangements and register today at cns.org/assfn.

Target Audience

Neurosurgeons, Neurologists, Neuroscientists, Neuroradiologists, Psychiatrists, Nurses, and Biomedical Engineers.

M E E T I N G D I R E C T O R S



Emad N. Eskandar, MD
ASSFN President
Massachusetts General Hospital
Boston, MA



Sameer A. Sheth, MD, PhD
Scientific Program Committee
Baylor College of Medicine
Houston, TX



Aviva Abosch, MD, PhD
Meeting Chairman
University of Colorado
Aurora, CO



Jennifer A. Sweet, MD
Scientific Program Committee
University Hospitals Case
Medical Center
Cleveland, OH



Nader Pouratian, MD, PhD
Scientific Program Chairman
University of California, Los Angeles
Los Angeles, CA



Cristin Welle, PhD
Scientific Program Committee
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Clement Hamani, MD, PhD
Scientific Program Committee
Sunnybrook Health Sciences Centre
University of Toronto
Toronto, ON



Steven Ojemann, MD
Local Arrangements Chairman
University of Colorado School
of Medicine
Aurora, CO



R. Mark Richardson, MD, PhD
Scientific Program Committee
University of Pittsburgh Medical Center
Pittsburgh, PA



HONORED GUEST: Philip A. Starr, MD, PhD
Dolores Cakebread Professor of Neurological Surgery
University of California, San Francisco; San Francisco, CA

Dr. Starr is the Dolores Cakebread Professor of Neurological Surgery at the University of California, San Francisco. He completed his neurosurgery residency at Brigham and Women's Hospital, followed by a fellowship in movement disorders surgery at Emory University with Drs. Roy Bakay and Mahlon Delong. He was recruited to UCSF in 1998 by Dr. Mitchel Berger to launch a clinical and research program in deep brain stimulation. His NIH-funded research addresses the effects of disordered basal ganglia output on cortical function in patients with movement disorders, mechanisms of therapeutic deep brain stimulation, and the use of totally implantable neural interfaces for long term brain recording and feedback-controlled DBS. With UCSF colleagues he developed new surgical approaches to achieve accurate implantation of drugs and devices at deep brain targets using interventional MRI. Dr. Starr, along with UCSF neurologist Dr. Jill Ostrem, directs a multidisciplinary clinic for comprehensive care of patients with movement disorders. Dr. Starr directs a fellowship training program in functional neurosurgery and is a past president of the American Society for Stereotactic and Functional Neurosurgery.

PROGRAM AT-A-GLANCE

SATURDAY, JUNE 2, 2018

7:00 am-6:00 pm

Registration

8:00 am-12:00 pm SPECIAL COURSE 1

Building a Functional
Neurosurgery Research Lab

1:00-5:00 pm SPECIAL COURSE 2

Functional Neurosurgery:
Optimizing Finances, Value,
and Efficiency

1:00-5:00 pm SPECIAL COURSE 3

Integrating New Technologies
into Your Functional
Neurosurgery Practice

SUNDAY, JUNE 3, 2018

6:00 am-6:00 pm

Registration

7:00-8:00 am

BREAKFAST SEMINAR 1

The Underutilization of
Functional Neurosurgery

8:00-9:20 am

PLENARY SESSION 1

World State of Affairs in
Functional Neurosurgery

9:20-10:00 am

Morning Break

10:00 am-12:00 pm

PLENARY SESSION 2

BRAIN Initiative

12:00-1:00 pm

Non-CME Sponsored
Lunch Session

1:00-2:40 pm

PLENARY SESSION 3

The Expanding Reach
of Functional Neurosurgery

2:40-3:20 pm

Afternoon Break

3:20-5:00 pm

PLENARY SESSION 4

Engaging Engineers: Getting
Technology to Clinical Practice

6:00-8:00 pm

Opening Reception

MONDAY, JUNE 4, 2018

6:30 am-5:30 pm

Registration

7:00-8:00 am

Non-CME Sponsored
Breakfast Session

7:30 am-6:00 pm

Exhibit Hall open

8:00-9:40 am

PLENARY SESSION 5

NeuroEthics

9:40-10:20 am

Morning Break with Exhibitors

10:20 am-12:00 pm

PLENARY SESSION 6

Costs, Cost Effectiveness,
and Outcomes in Functional
Neurosurgery

12:00-1:00 pm

Lunch & Honored Guest Talk

1:00-2:40 pm

PARALLEL SESSION 1

Psychiatric Neurosurgery

PARALLEL SESSION 2

Movement Disorders

2:40-3:20 pm

Afternoon Break with Exhibitors

3:20-5:00 pm

Poster Session with Wine & Cheese

5:10 - 6:00 pm

ASSFN Business Meeting

TUESDAY, JUNE 5, 2018

6:30 am-5:00 pm

Registration

7:00-8:00 am

Non-CME Sponsored
Breakfast Session

7:30 am-3:30 pm

Exhibit Hall open

8:00-9:40 am

PLENARY SESSION 7

Network Modulation and
Connectomics for Neurosurgery

9:40-10:20 am

Morning Break with Exhibitors

10:20 am-12:00 pm

PARALLEL SESSION 3

Pain

PARALLEL SESSION 4

Epilepsy

12:00-1:00 pm

Non-CME Sponsored
Lunch Session

1:00-2:50 pm

PARALLEL SESSION 5

Technology in Functional
Neurosurgery

PARALLEL SESSION 6

Radiosurgery

2:50-3:30 pm

Afternoon Break with Exhibitors

3:30-3:40 pm

ASSFN Award Ceremony

3:40-5:00 pm

PLENARY SESSION 8

Engaging Industry: Getting
Technology to Market

MEETING AGENDA

**SATURDAY,
JUNE 2, 2018**

8:00 am-12:00 pm

**Residents/Fellows: \$150
ASSFN Members/Non-
member Physicians: \$250**

SPECIAL COURSE 1

**Building a Functional
Neurosurgery Research Lab**

Course Directors: Jeffrey G. Ojemann, Mark Richardson

Speakers: Harith Akram, Nicholas M. Boulis, Edward F. Chang, Itzhak Fried, Robert E. Gross, Michael G. Kaplitt, Mark Richardson, Philip A. Starr, Kareem A. Zaghloul

Learning Objectives:

Upon completion of this course, participants will be able to:

- Identify key elements for successfully integrating clinical science into clinical practice
- Describe key methods and analytic strategies for imaging and neurophysiological data acquired in functional neurosurgery patients
- Discuss the opportunities provided by the BRAIN initiative to excel as a neurosurgeon-scientist

Introduction and Welcome

Jeffrey G. Ojemann

Successful Labs

- **Cognitive Neuroscience**
Itzhak Fried
- **Language Laboratory**
Edward F. Chang
- **Stem Cell Laboratory**
Nicholas M. Boulis

Primer on Neurophysiological Recordings

Mark Richardson

Signal Acquisition and Processing

Kareem A. Zaghloul

Primer on Advanced Neuroimaging Analyses

Harith Akram

Primer on Gene Therapy

Michael G. Kaplitt

The Resources You Need

Group Discussion

The BRAIN Initiative and its Impact on Functional Neurosurgery Science

Philip A. Starr

1:00-5:00 pm

**Residents/Fellows: \$150
ASSFN Members/Non-
member Physicians: \$250**

SPECIAL COURSE 2

**Functional Neurosurgery:
Optimizing Finances, Value
and Efficiency**

Course Director:

Joshua M. Rosenow

Speakers: Zachary Hochstetler, Peter Konrad, Darlene A. Lobel, Julie G. Pilitsis, Joshua M. Rosenow, Ann R. Strock

Learning Objectives:

Upon completion of this course, participants will be able to:

- Discuss how physicians and hospitals are reimbursed for functional neurosurgery procedures
- Review the process of creating CPT codes and their RVU values
- Describe the integration of allied health providers in optimizing clinical care
- Identify the role of physician advocacy in neurosurgery

Introduction and Welcome

Joshua M. Rosenow

DBS Surgery: Building a Practice and Coding

Darlene A. Lobel

Surgery for Chronic Pain: Building a Practice and Coding

Julie G. Pilitsis

Epilepsy Surgery: Building a Practice and Coding

Joshua M. Rosenow

CPT and RUC Process—View from the AMA

Zachary Hochstetler

Washington Committee Update

Peter Konrad

Physician Advocacy

Ann R. Strock

Roundtable Discussion

1:00-5:00 pm

**Residents/Fellows: \$150
ASSFN Members/Non-
member Physicians: \$250**

SPECIAL COURSE 3

**Integrating New
Technologies into your
Functional Neurosurgery
Practice**

Course Director: Paul S. Larson

Speakers: Stephan Chabardes, Voelker A. Coenen, W. Jeffrey Elias, Kelly D. Foote, Mojgan Hodaie, Paul S. Larson, Mark Richardson, Gary K. Steinberg, Jennifer A. Sweet, Jon T. Willie, Daniel Yoshor

Learning Objectives:

Upon completion of this course, participants will be able to:

- Describe key new technologies introduced into clinical functional neurosurgery practice
- Identify the role, limitation, and integration of new technologies into practice

MEETING AGENDA

- Review emerging therapies that may impact clinical practice in the near term

Introduction

Paul S. Larson

New Pain Technologies: DRG, High Frequency, and Burst Stimulation

Jennifer A. Sweet

Robots in Functional Neurosurgery

Stephan Chabardes

sEEG: Interpreting the Network Signal

Daniel Yoshor

Directional Leads

Voelker A. Coenen

Integrating Tractography into Clinical Practice

Mojgan Hodaie

Stereotactic Laser Ablation

Jon T. Willie

Focused Ultrasound

W. Jeffrey Elias

Emerging Technologies: Gene Therapies

Mark Richardson

Emerging Therapies: Stem Cell Trials

Nicholas M. Boulis

Primer on Closed Loop DBS

Kelly D. Foote

Speakers: Edward F. Chang, Donald M. Whiting, Ashwin Viswanathan

Learning Objectives:

Upon completion of this session, participants will be able to:

- Describe the prevalence of medically-refractory epilepsy, rates of epilepsy surgery, and factors that affect underutilization of epilepsy surgery
- Review the prevalence of movement disorders, rates of movement disorder surgeries, and factors that affect underutilization of these surgeries
- Identify factors that affect underutilization of pain surgery in light of recent societal focus on the opioid epidemic

Epilepsy

Edward F. Chang

Movement Disorders DBS

Donald M. Whiting

Surgery for Pain

Ashwin Viswanathan

8:00-9:20 am

Plenary Session 1

World State of Affairs in Functional Neurosurgery

Moderator: Aviva Abosch

Speakers: Aviva Abosch, Terry J. Coyne, Emad N. Eskandar, Damianos Sakas, Michael Schulder

Learning Objectives:

Upon completion of this session, participants will be able to:

- Describe the activities of major world societies that focus on functional and stereotactic neurosurgery
- Review differences in priority areas for stereotactic and functional neurosurgery internationally

- Identify current shortcomings and future needs for functional and stereotactic neurosurgery around the world

8:00-8:05 am

Meeting Introduction

Aviva Abosch

8:10-8:55 am

World Society Updates

WSSFN: Michael Schulder

ESSFN: Damianos Sakas

AASSFN: Terry J. Coyne.

Other Societies, to be announced.

8:55-9:00 am

Introduction of ASSFN President

Aviva Abosch

9:00-9:20 am

Presidential Address

Emad N. Eskandar

9:20-10:00 am

Morning Break

10:00 am-12:00 pm
Plenary Session 2

BRAIN Initiative

Moderators: Edward F. Chang, Nitin Tandon

Speakers: James W. Gnadt, Tristan McClure-Begley, David McMullen

Learning Objectives:

Upon completion of this session, participants will be able to:

- Describe the goals of the BRAIN Initiative as it pertains to advancing mental health
- Review how the BRAIN Initiative is utilizing neurosurgery to advance our basic science understanding of human brain function
- Describe the vision of DARPA for advancing military health through the BRAIN Initiative

SUNDAY,
JUNE 3, 2018

7:00-8:00 am \$55
Breakfast Seminar 1

The Underutilization of
Functional Neurosurgery

Moderator: Edward F. Chang

MEETING AGENDA

10:00-10:20 am

The Goals of the BRAIN Initiative for Mental Health

David McMullen

10:20-10:40 am

BRAIN Initiative and Basic Science of Human Brain Function

James W. Gnadt

10:40-11:00 am

DARPA and BRAIN: The Impact and Future

Tristan McClure-Begley

11:00 am-12:00 pm

BRAIN Investigator Updates: The Scientific Impact of Neurosurgery

12:00-1:00pm
Sponsored Lunch Session

Non-CME Sponsored Lunch Session

1:00-2:40 pm
Plenary Session 3

The Expanding Reach of Functional Neurosurgery

Moderators: Aviva Abosch, Emad N. Eskandar

Speakers: Robert Greenberg, Kalyanam Shivkumar, Cristin Welle

Learning Objectives:

Upon completion of this session, participants will be able to:

- Discuss the role of peripheral neuromodulation in shaping brain activity
- Review the role of neurophysiology and neurostimulation in modulating cardiac health
- Describe the opportunities and challenges of using high density arrays to restore vision for the blind

- Describe how interfacing with the human brain may shape the future of society

1:00-1:20 pm

SPARC: Peripheral Stimulation can do more than Treat Pain

Cristin Welle

1:20-1:40 pm

SPARC: Neurocardiology: All Surgery will be Neurosurgery in the Future

Kalyanam Shivkumar

1:40-2:00 pm

Visual Cortex Stimulation and High Density Brain Stimulation

Robert Greenberg



2:30-2:40 pm

Questions and Discussion

2:40-3:20 pm
Afternoon Break

3:20-5:00 pm
Plenary Session 4

Engaging Engineers: Getting Technology to Clinical Practice

Moderators: Jonathan Miller, Ali R. Rezai

Speakers: John Chae, J. Luis Lujan, Michael M. Maharbiz, Dejan Markovic, John Vimenti

Learning Objectives:

Upon completion of this session, participants will be able to:

- Describe emerging sensing technologies for neuromodulation
- Review distinct modalities for neuromodulation, including electrical and non-electrical stimulation
- Identify key challenges and advances in microchip design towards miniaturization of neuromodulatory devices

3:20-3:50 pm

Emerging Sensing Technologies

3:20-3:35 pm

Chemical Sensing: Current Status and Barriers

J. Luis Lujan

3:35-3:50 pm

Ultra-Thin and Flexible Electrodes

John Vimenti

3:50-4:05 pm

Emerging Microchip Design

Dejan Markovic

MEETING AGENDA

4:05-4:20 pm

Functional Electrical Stimulation

John Chae

4:20-4:35 pm

Nonelectrical Stimulation

Michel M. Maharbiz

4:35-5:00 pm

Open Discussion

6:00-8:00 pm

Opening Reception

**MONDAY,
JUNE 4, 2018**

7:00-8:00 am

Sponsored Breakfast Session

Non-CME Sponsored Breakfast Session

8:00-9:40 am

Plenary Session 5

NeuroEthics

Moderators: Clement Hamani, Zelma HT Kiss

Speakers: Tipu Z. Aziz, Judy Illes, Andres M. Lozano, Nitin Tandon

Learning Objectives:

Upon completion of this session, participants will be able to:

- Identify key factors that influence our understanding of the neuroethics of "brain patenting"
- Review whether DBS and invasive intracranial recordings are safe enough to be used as an exploratory therapeutic tool
- Discuss considerations related to cosmetic neurosurgery to enhance "normal"

8:00-8:18 am

Neuroethics of Brain Patenting

Judy Illes

8:18-8:36 am

Is DBS Really Safe?

Tipu Z. Aziz

8:36-8:54 am

How Far are we from Cosmetic Neurosurgery?

Andres M. Lozano

8:54-9:12 am

The Slippery Slope of Intracranial Recordings and Stimulation for Research

Nitin Tandon

9:12-9:40 am

Open Papers

9:40-10:20 am

Morning Break with Exhibitors

10:20 am-12:00 pm
Plenary Session 6

Costs, Cost Effectiveness and Outcomes in Functional Neurosurgery

Moderators: Ahmed M.T. Raslan, Joshua M. Rosenow

Speakers: Casey H. Halpern, Peter Konrad, Ashwini D. Sharan

Learning Objectives:

Upon completion of this session, participants will be able to:

- Discuss whether early deep brain stimulation for movement disorders may reduce overall health care expenditures for movement disorders
- Review the cost effectiveness of DBS for movement disorders
- Identify key opportunities and obstacles for using big data emerging from functional neurosurgery to impact clinical care



MEETING AGENDA

10:20-10:40 am

Can Early DBS save the Health Care System Money

Peter Konrad

10:40-11:00 am

The Cost Effectiveness of DBS for Movement Disorders

Casey H. Halpern

11:00-11:20 am

The Potential for Big Data to Impact Functional Neurosurgery

Ashwini D. Sharan

11:20 am-12:00 pm

Open Papers

12:00-1:00 pm
Lunch and Honored Guest Talk

Philip A. Starr

1:00-2:40 pm
Parallel Session 1

Psychiatric Neurosurgery

Moderators: Emad N. Eskandar, Sameer A. Sheth

Speakers: Andrew Drysdale, Wayne Goodman, Suzanne N. Haber

Learning Objectives:

Upon completion of this session, participants will be able to:

- Identify the array of brain regions that have been targeted for psychiatric neuromodulation and how these relate anatomically
- Discuss the role of advanced imaging in identifying disease subtypes and how this could be used to stratify patients for therapy or clinical trials

- Review different clinical trial designs and the opportunities and limitations of each, with special focus on psychiatric applications

1:00-1:20 pm

The Structural Connectivity and Convergence of Neuropsychiatric Targets for DBS

Suzanne N. Haber

1:20-1:40 pm

Using Imaging to Define Subtypes of Disease

Andrew Drysdale

1:40-2:00 pm

Optimizing Clinical Trial Design in Psychiatric Neurosurgery

Wayne Goodman

2:00-2:40 pm

Open Papers

1:00-2:40 pm
Parallel Session 2

Movement Disorders

Moderators: Ron L. Alterman, Alon Y. Mogilner

Speakers: Ron L. Alterman, Warren Grill, Philip A. Starr, Ludvic Zrinzo

Learning Objectives:

Upon completion of this course, participants will be able to:

- Describe the advantages of limitations of awake versus asleep deep brain stimulation implantation surgery
- Review what has been gleaned from invasive human studies about the pathophysiology of movement disorders
- Discuss mechanisms underlying the therapeutic benefits of deep brain stimulation

1:00-1:15 pm

The Patient Must be Awake for DBS Implantation

Ron L. Alterman

1:15-1:30 pm

Asleep DBS Implantation is the New Standard

Ludvic Zrinzo

1:30-1:45 pm

The Neurosurgical Science of Movement Disorders

Philip A. Starr

1:40-2:00 pm

Therapeutic Mechanisms of Deep Brain Stimulation

Warren Grill

2:00-2:40 pm

Open Papers

2:40-3:20 pm
Afternoon Break with Exhibitors

3:20-5:00 pm
Poster Session with Wine & Cheese

Moderator: Zelma HT Kiss

Learning Objective:

Upon completion of this session, participants will be able to:

- Provide examples of recent research in functional neurosurgery that expands our understanding, therapy, or technology of neurological diseases treated by functional neurosurgery.

5:10-6:00 pm
ASSFN Business Meeting

Presiding Officer:
Emad N. Eskandar

MEETING AGENDA

**TUESDAY,
JUNE 5, 2018**

**7:00-8:00 am
Sponsored
Breakfast Session**

**Non-CME Sponsored
Breakfast Session**

**8:00-9:40 am
Plenary Session 7**

**Network Modulation
and Connectomics for
Neurosurgery**

Moderator: Nader Pouratian

Speakers: Suzanne N. Haber, Cameron McIntyre, Sameer A. Sheth

Learning Objectives: Upon completion of this session, participants will be able to:

- Describe key imaging and neurophysiological approaches to measuring and detecting structural and functional connectivity
- Identify approaches for visualizing structural brain networks, with a focus on its relevance to neuromodulation
- Review the network basis of neuropsychiatric disease and functional neurosurgical therapies

8:00-8:18 am

**Primer on Detecting and
Quantifying Brain Networks**

Nader Pouratian

8:18-8:36 am

Visualizing Brain Networks

Cameron McIntyre

8:36-8:54 am

The Network Basis of Disease

Suzanne N. Haber

8:54-9:12 am

The Network Basis of Therapy

Sameer A. Sheth

9:12-9:40 am

Open Papers

**9:40-10:20 am
Morning Break
with Exhibitors**

**10:20 am-12:00 pm
Parallel Session 3**

Pain

Moderators: Julie G. Pilitsis, Jennifer A. Sweet

Speakers: Tipu Z. Aziz, Jennifer A. Sweet, Ashwin Viswanathan

Learning Objectives:

Upon completion of this session, participants will be able to:

- Review the selection of patients for lesioning in the management of chronic pain
- Discuss the role and outcomes of DBS for chronic pain
- Identify central and peripheral nervous system targets for modulating and treating chronic pain beyond traditional dorsal column stimulation

10:20-10:40 am

**The Re-emergence of Lesional
Therapies for Pain**

Ashwin Viswanathan

10:40-11:00 am

**Targets beyond the Dorsal
Columns for Pain**

Jennifer A. Sweet

11:00-11:20 am

**Deep Brain Stimulation for Pain:
VC/VS and ACC**

Tipu Z. Aziz

11:20-12:00 pm

Open Papers

**10:20 am-12:00 pm
Parallel Session 4**

Epilepsy

Moderator: Nitin Tandon

Speakers: Patrick Chauvel, Itzhak Fried, Guy M. McKhann, Jonathan Miller

Learning Objectives:

Upon completion of this session, participants will be able to:

- Describe and contrast network versus focal approaches to evaluating and treating patients with medically refractory epilepsy
- Identify the opportunities and limitations of more targeted therapies, such as laser ablation and deep brain stimulation, in the management of medically refractory epilepsy
- Review what has been learned from sEEG and chronic sensing devices about human cognition

10:20-10:35 am

**Epilepsy Surgery is
Network Surgery**

Patrick Chauvel

10:35-10:50 am

**Who Cares About Networks? All
Epilepsy is Focal**

Jonathan Miller

10:50-11:05 am

**Less is More: Epilepsy Surgery
in the Era of Ablation and
Neuromodulation**

Guy M. McKhann

11:05-11:20 am

Probing Neural Function and Circuits with sEEG and Neuropace

Itzhak Fried

11:20 am-12:00 pm

Open Papers

12:00-1:00 pm

Sponsored Lunch Session

Non-CME Sponsored Lunch Session

1:00-2:50 pm

Parallel Session 5:

Technology in Functional Neurosurgery

Moderators: Jonathan Miller, Mark Richardson

Speakers: Voelker A. Coenen, Kelly D. Foote, Nitin Tandon

Learning Objectives: Upon completion of this session, participants will be able to:

- Delineate the potential advantages of directional leads for deep brain stimulation and the data supporting this innovation
- Discuss the growth of responsive neurostimulation in epilepsy and emerging uses of these closed loop systems
- Review results that have emerged from chronically implanted sensing devices and how this may impact the future of neuromodulation and functional neurosurgery

1:00-1:20 pm

Directional Leads: A Real or Theoretical Advantage?

Voelker A. Coenen

1:20-1:40 pm

Neuropace: Indications and Opportunities

Nitin Tandon

1:40-2:00 pm

What We've Learned from Chronic Sensing

Kelly D. Foote

2:00-2:50 pm

Open Papers

1:00-2:50 pm

Parallel Session 6

Radiosurgery

Moderator: Michael Schulder

Speakers: Or Cohen-Inbar, Michael Schulder

Learning Objectives: Upon completion of this session, participants will be able to:

- Describe the impact that frameless radiosurgical approaches and hypofractionation have had on clinical practice
- Identify how the exponential growth in immunotherapies has impacted the use and outcomes of cranial radiosurgery
- Review the distinct approaches to treating large intracranial arteriovenous malformations and the outcomes for each

1:00-1:20 pm

The Impact of Fractionated Stereotactic Radiosurgery

Antonio DeSalles

1:20-1:40 pm

The Impact of Immunotherapies on Complications of Radiosurgery

Michael Schulder

1:40-2:00 pm

Dose Staging versus Volume Staging for Large AVMS

Or Cohen-Inbar

2:00-2:50 pm

Open Papers

2:50-3:30 pm

Afternoon Break with Exhibitors

3:30-3:40 pm

ASSFN Award Ceremony

3:40-5:00 pm

Plenary Session 8
Non-CME Session

Engaging Industry: Getting Technology to Market

Moderators: Nicholas M. Boulis, Andre Machado

Speakers: Ashok Gowda, Bertin Nahum

3:40-3:55 pm

What Clinicians Need from Industry

Andre Machado

3:55-4:40 pm

Examples of Successful Collaboration

3:55-4:10 pm

Visualase

Ashok Gowda

4:10-4:25 pm

Medtech/ROSA

Bertin Nahum

4:25-4:40 pm

Stimwave

4:40-5:00 pm

Open Discussion

5:00 pm

Meeting Adjourns

All speakers and topics are subject to change.

Meeting Location

The Westin Denver Downtown
1672 Lawrence Street, Denver, CO 80202
Telephone: 303-572-9100

Hotel Reservations

To book a reservation at The Westin Denver Downtown at the group rate of \$239, please use this web address: <http://bit.ly/zyzLYCo>. Or, you can click on the link on the ASSFN website (assfn.org) or call 888-627-8435 and reference "ASSFN 2018 Biennial Meeting."

The deadline for making reservations at the ASSFN group rate is **Thursday, May 10, 2018**. Any reservations requested after this date will be based on availability.

Complimentary internet will be provided in all ASSFN attendee guestrooms.

Deposit

Reservations must be guaranteed by a major credit card equal to one night's room and tax.

Changes and Cancellations

For changes to your hotel reservation, please contact The Westin Denver Downtown at 888-627-8435.

If you cancel by 6:00 pm, US Mountain Time, 48 hours prior to check in date, there will be no forfeiture amount.

If you cancel after 6:00 pm, US Mountain Time, the forfeiture amount will be the cost of one night's stay plus tax.

Meeting Registration

Register today using one of these four methods:

Online: www.wynjade.com/cns/assfn18

Fax: 972-349-7437

Phone: 800-931-9543 or 972-349-5539

Mail: ASSFN Registration and Housing Center

6100 W. Plano Parkway, Suite 3500
Plano, TX 75093

The ASSFN Registration Center is not responsible for faxes or emails not received due to circumstances beyond their control.

What's Included in the Registration Fee?

Medical registration includes the following:

- Daily Continental Breakfasts
- Daily Beverage Breaks

- Daily Plenary and Parallel Sessions
- Entrance to the Exhibit Hall
- One ticket to Sunday Opening Reception
- Admittance to the Poster Session with Wine & Cheese on Monday

Registration Cancellation/Refund Policy

All refund requests must be received in writing by May 10, 2018.

Requests accepted via:

Email: ASSFN@wynndhamjade.com

Fax: 972-349-7437

Mail: ASSFN Registration Center
6100 W. Plano Parkway, Suite 3500
Plano, TX 75093

Cancellations made before May 10, 2018

Receive a full refund less \$100 processing fee. Pre-meeting course registration fees will be refunded in full until this date.

Cancellations made after May 10, 2018, and no-shows

Absolutely no refunds will be issued after this date for registration and pre-meeting courses regardless of cause.

Americans with Disabilities Act/Special Needs and Requests

The ASSFN wishes to take the necessary steps to ensure that no individual with a disability is excluded, denied services, segregated or otherwise treated differently than any other individual because of the absence of auxiliary aids and services. Please let us know if, under the ADA, you require special accommodations or services in order to attend the ASSFN Biennial Meeting.

Your requirements should be sent directly to the ASSFN Registration Center at: ASSFN@wynndhamjade.com, or call 888-739-9842. Please provide any requests at least 30 days prior to the Biennial Meeting to guarantee accommodation.

Accreditation

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Congress of Neurological Surgeons and the American Society for Stereotactic and Functional Neurosurgery. The Congress of Neurological Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA Credit Designation Statement

The CNS designates this live activity for a maximum of 33.5 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

CME Credit

A maximum of 29.5 *AMA PRA Category 1 Credits™* may be earned for Scientific Sessions only.

Additional CME credits can be earned by attending the optional Saturday half-day courses (four (4) credits).

Physician Assistant/Physician Extender: Attendees will receive credits for attendance at the Plenary/Parallel Sessions and for any optional events attended. Each physician assistant/physician extender should contact his or her individual membership association and certification board to determine the requirements for accepting credits. All attendees will receive a Certificate of Attendance.

Posters

Physicians may claim *AMA PRA Category 1 Credits™* directly from the AMA for preparing a poster presentation, which also includes the published abstracts. Physicians may claim credits on their *AMA PRA* certificate application, or apply directly to the AMA for an *AMA PRA Category 1 Credit™* certificate.

Physicians may claim *AMA PRA Category 2 Credits™* for viewing scientific posters. Physicians should self-claim credit on their *AMA PRA* certificate application form.

ADVANCE REGISTRATION FORM

ADVANCE DEADLINE: Thursday, May 10, 2018: All meeting confirmations will be sent via email.

FOUR WAYS TO ADVANCE REGISTER:

- | | |
|--|---|
| <p>1. Online: (Credit card only)
www.wynjade.com/cns/assfn18</p> <p>2. Phone: 888-739-9842 or 972-349-7556</p> | <p>3. Fax: 972-349-7437</p> <p>4. Mail: ASSFN Registration Center, 6100 W. Plano Parkway, Suite 3500, Plano, TX 75093</p> |
|--|---|

REGISTRATION INFORMATION

Please print or type legibly using one form per person. The name and address below will be used for the CME Certificate.

LAST NAME	FIRST NAME	CREDENTIALS		
INSITUATION/HOSPITAL/OFFICE/COMPANY	NATIONAL PROVIDER IDENTIFIER (NPI) NUMBER			
ADDRESS	CITY	STATE/PROVINCE	COUNTRY	ZIP/POSTAL CODE
TELEPHONE (International, include country code) FAX		EMAIL		

Hotel Reservations: To book a reservation at The Westin Denver Downtown at the group rate of \$239, please use this web address: <http://bit.ly/2yzLYCo>, or visit the ASSFN website (assfn.org), or call 888-627-8435 and reference “ASSFN 2018 Biennial Meeting.” Subject to availability.

The deadline for making reservations at the ASSFN group rate is Thursday, May 10, 2018. Any reservations requested after this date will be based on availability. Complimentary internet will be provided in all ASSFN attendee guestrooms.

Deposit: Reservations must be guaranteed by a major credit card equal to one night’s room and tax.

Changes and Cancellations: For changes to your hotel reservation, please contact The Westin Denver Downtown at 888-627-8435. If you cancel by 6:00 pm, US Mountain Time, 48 hours prior to check in-date, there will be no forfeiture amount. If you cancel after 6:00 pm, US Mountain Time, within the 48 hours of your check in-date, the forfeiture amount will be the cost of one night’s stay plus tax.

REGISTRATION CATEGORY

	RECEIVED ON OR BEFORE MAY 10, 2018	RECEIVED AFTER MAY 10, 2018
PHYSICIANS		
ASSFN Member Physician <i>(including foreign ESSFN/WSSFN members - subject to verification)</i>	<input type="checkbox"/> \$595	<input type="checkbox"/> \$695
Nonmember Physician	<input type="checkbox"/> \$795	<input type="checkbox"/> \$895
Nonmember Physician: <i>Join ASSFN* and register (includes \$300 membership application fee)</i>	<input type="checkbox"/> \$895	<input type="checkbox"/> \$995
NON-PHYSICIANS: PhD / RN / NP / PA/ Students		
Graduate Students/Post-doctorates* <i>(Must submit a letter confirming student status.)</i>	<input type="checkbox"/> \$200	<input type="checkbox"/> \$300
ASSFN Associate member, Non-physician <i>(PhD, RN/NP/PA)</i>	<input type="checkbox"/> \$325	<input type="checkbox"/> \$425
Nonmember Associate, Non-physician <i>(PhD, RN/NP/PA)</i>	<input type="checkbox"/> \$475	<input type="checkbox"/> \$575
Nonmember Associate, Non-physician: <i>Join ASSFN* and register (PhD, RN/NP/PA)</i> <i>(includes \$160 membership application fee)</i>	<input type="checkbox"/> \$485	<input type="checkbox"/> \$485
RESIDENTS/FELLOWS		
Resident/Fellow <i>(with letter from Program Director)</i>	<input type="checkbox"/> \$325	<input type="checkbox"/> \$425

SUBTOTAL FOR REGISTRATION SECTION \$ _____

ADDITIONAL COURSES

BREAKFAST SEMINAR - SUNDAY, JUNE 3

<input type="checkbox"/> The Underutilization of Functional Neurosurgery	7:00-8:00 am
All registration categories	\$55
<hr/>	
SUBTOTAL FOR BREAKFAST SEMINAR	\$ _____

PRE-MEETING SPECIAL COURSES - SATURDAY, JUNE 2 - *Seating Is Limited*

<input type="checkbox"/> Building a Functional Neurosurgery Research Lab	8:00 am-12:00 pm
Residents/Fellows	\$150
ASSFN Members	\$250
Nonmember Physicians	\$250
<hr/>	
<input type="checkbox"/> Functional Neurosurgery: Optimizing Finances, Value, and Efficiency	1:00-5:00 pm
Residents/Fellows	\$150
ASSFN Members	\$250
Nonmember Physicians	\$250
<hr/>	
<input type="checkbox"/> Integrating New Technologies into Your Functional Neurosurgery Practice	1:00-5:00 pm
Residents/Fellows	\$150
ASSFN Members	\$250
Nonmember Physicians	\$250
<hr/>	
SUBTOTAL FOR PRE-MEETING COURSES	\$ _____

PAYMENT

REGISTRATION TOTAL	\$ _____
PRE-MEETING SPECIAL COURSES	\$ _____
BREAKFAST SEMINAR	\$ _____
REGISTRATION GRAND TOTAL	\$ _____

Credit Card Authorization: Credit card will be charged immediately

- Visa
 MasterCard
 American Express

CREDIT CARD NUMBER	EXPIRATION DATE	CVV CODE
NAME OF CARD HOLDER (print)	SIGNATURE (I agree to pay according to the credit card issuer agreement)	

By signing this form, I authorize the ASSFN Registration Center to charge my credit card for the total payment due, acknowledge that the ASSFN registration cancellation policies are in effect and grant the ASSFN the right to use photos taken at the ASSFN Annual Meeting which include me in promotional materials for future meetings. These fees are subject to audit in case of error. The ASSFN Registration Center reserves the right to correct the error and charge the appropriate fees.

Check: Full amount must accompany your registration form. Please make check payable to the ASSFN Registration Center. Please send your check to: ASSFN Registration Center, 6100 W. Plano Parkway, Suite 3500, Plano, TX 75093. (Any checks received from an overseas bank will be returned. Any checks returned for insufficient funds are subject to additional charges.)

Registration Cancellation Policy: Full registrations refunds, less a \$100 processing fee, will be granted if written requests for cancellation are received by May 10, 2018. No refunds of any kind will be given after this date. Refunds will not be given for no shows. Written requests may be emailed to ASSFN@wyndhamjade.com, faxed to 972-349-7437, or mailed to ASSFN Registration Center, 6100 W. Plano Parkway, Suite 3500, Plano, TX 75093.

INDUSTRY INTERACTION OPPORTUNITIES

EXHIBIT HALL HOURS

Monday, June 4, 2018: 7:30 - 6:00 pm

Tuesday, June 5, 2018: 7:30 - 3:30 pm

BEVERAGE BREAKS IN THE EXHIBIT HALL

Monday, June 4, 2018: 9:40 - 10:20 am

Monday, June 4, 2018: 2:40 - 3:20 pm

Tuesday, June 5, 2018: 9:40 - 10:20 am

Tuesday, June 5, 2018: 2:50 - 3:30 pm

INDUSTRY SPONSORED ACTIVITIES

Sponsored Breakfast Symposia

Monday, June 4, 2018: 7:00 - 8:00 am

Tuesday, June 5, 2018: 7:00 - 8:00 am

Sponsored Lunch Symposia

Sunday, June 3: 12:00 - 1:00 pm

Tuesday, June 5: 12:00 - 1:00 pm

2016 EXHIBITORS

Ad-Tech Medical

Alpha & Omega

Boston Scientific

Brainlab

Cosman

Medical

Elekta

FHC

Focused Ultrasound

Insightec

Integra

Liva Nova

Mazor Robotics

Medtech

Medtronic

Monteris Medical

MRI Interventions

Neurologica

Neuropace

Nevro

Nuvector

PMT Corporation

Renishaw

Sceneray

St. Jude



DATES TO REMEMBER

Wednesday, January 10
Abstract Submission Deadline

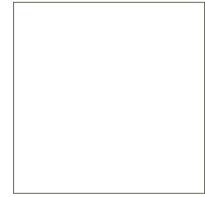
Thursday, May 10
Advance Registration Closes

Friday, May 10
*Group Hotel Rate Deadline
& Registration Refund Deadline*

Saturday, June 2
*ASSFN 2018 Biennial
Meeting Begins*

Tuesday, June 5
Meeting Adjourns

American Society for
Stereotactic and Functional Neurosurgery
10 N. Martingale Road, Suite 190
Schaumburg, IL 60173-2294



American Society for Stereotactic
and Functional Neurosurgery

2018 | BIENNIAL MEETING

P R E L I M I N A R Y P R O G R A M

D E N V E R , C O L O R A D O

The Westin Denver Downtown • June 2-5, 2018