



North American Neuro-Ophthalmology Society
45th Annual Meeting

March 16– March 21, 2019
Red Rock Casino, Resort & Spa • Las Vegas, Nevada

Saturday, March 16

8:00 am -12:00 pm
3:00 pm – 4:30 pm

NANOS Board Meeting
Orbital and Sellar Lesions-Neuro-radiology
Pearls and Pitfalls

Veranda DE
Red Rock Ballroom

Moderator: Madhura Tamhankar, MD

This session is designed to provide participants working in multi-disciplinary programs with important points of information regarding selection of appropriate imaging modalities and sequences within those modalities, as well as strategies for image analysis to precisely evaluate pathology involving the optic nerves and other cranial nerves that affect vision. This session will: 1) review MR and CT imaging protocols for intra-orbital pathology, pathology of the visual pathway, and other cranial nerves 2) discuss the evaluation of intra-orbital neoplasia including primary orbital tumors and tumors/pathology that secondarily involve the orbit through direct growth from surrounding areas (paranasal sinuses, bone), perineural spread, and metastatic disease and 3) discuss sellar and parasellar pathology that may involve/compress the visual pathway and/or extend to the cavernous sinuses.

Upon completion of this session, participants should be able to: 1) determine if cross-sectional imaging is necessary 2) select the best test when imaging is necessary 3) describe their role in communicating with their neuroradiologists to optimize protocol selection 4) identify when specialized high resolution MR imaging is necessary 5) identify MR protocols and sequences for evaluating sellar and parasellar disease and 6) discuss imaging findings that distinguish neoplastic from inflammatory disease.

3:00 - 4:30 pm

Orbital and Sellar Lesions- Neuro-radiology Pearls
and Pitfalls, Laurie Loevner, MD

6:00 pm - 7:30 pm

Opening Reception (All are welcome!)

Pavilion Ballroom

Sunday, March 17

6:00 am – 6:45 am
6:30 am – 7:30 am
7:30 am – 9:30 am

Yoga
Breakfast
Frank B. Walsh

Charleston Ballroom
Red Rock Ballroom

This session is designed to present a wide variety of neuro-ophthalmic cases to an audience of physicians with varying neuroscience backgrounds who have a common intellectual interest in the broad range of conditions that impact the human visual pathways and ocular motor systems.

The format is a clinicopathologic conference. Clinical cases will be presented by neuro-ophthalmologists with comments by a neuroradiologist, neuropathologist and other selected experts. Neuroimaging, laboratory and surgical pathology data will help illustrate clinical point. Cases will be discussed from clinical, anatomic, radiologic and pathologic aspects with emphasis on diagnosis, pathophysiology and management. Audience participation is encouraged.

Upon completion of this course, participants should be able to: 1) recognize the varied presentations of neuro-ophthalmic disease 2) correlate the anatomic localization and histopathologic appearance with the clinical presentations 3) use radiologic procedures in diagnosis effectively 4) recognize both the value and limitations of neuropathology and 5) discuss newly described diseases and their connection to neuro-ophthalmology.

7:30 am – 7:45 am	Welcome and Intro to mobile app	
7:45 am – 8:05 am	A Zebra among Zebras, Peter W. Mortensen, MD	
8:05 am – 8:25 am	The Great Masquerade, Bart K. Chwalisz, MD	
8:25 am – 8:45 am	Chalky Pallid Edema, Daniel L. Kornberg, MD	
8:45 am – 9:05 am	A-deno what's going on! Christine Greer, MD	
9:00 am – 9:25 am	Go with your gut feeling, Paul R. Freund, MD, MSc, FRCSC	
9:25 am – 9:30 am	Wrap-up	
9:30 am – 10:00 am	Coffee break	Charleston Ballroom
10:00 am – 12:00 pm	Frank B. Walsh (II)	Red Rock Ballroom
10:00 am – 10:20 am	Fire and Ice, Mary D. Maher, MD	
10:20 am – 10:40 am	Unexplained becomes explained, Jinu Han	
10:40 am – 11:00 am	A Trip Through the Wormhole, Anne Kao, MD	
11:00 am – 11:20 am	Three's a Crowd, Kanwal S. Matharu, MD	
11:20 am – 11:40 am	Don't Drink the Water, Devon A. Cohen, MD	
11:40 am – 11:45 am	Morning Wrap-up	
12:00 pm – 12:30 pm	Lunch	Charleston Ballroom
12:00 pm – 12:30 pm	Fellowship Directors Committee Meeting	Veranda AB
12:30 pm – 1:00 pm	International Relations Committee Meeting	Veranda E
12:30 pm – 2:30 pm	Poster Session I: Clinical Highlights	Red Rock Ballroom A-C
12:30 - 1:30 pm	Odd Numbered Posters	
1:30 - 2:30 pm	Even Numbered Posters	
2:30 pm – 3:00 pm	Business Meeting	Red Rock Ballroom
3:00 pm – 5:15 pm	Frank B. Walsh	Red Rock Ballroom
3:00 pm – 3:20 pm	Every Rose Has Its Thorn, William J. Anderson, BS	
3:20 pm – 3:40 pm	Not the Rolling Stones, Ari A. Shemesh, MD	
3:40 pm – 4:00 pm	Foiled Thrice, Jonathan A. Micieli, MD, CM	
4:00 pm – 4:20 pm	At the Crossroads, Konstantinos Douglas, MD, DVM, MBA	
4:20 pm - 4:40 pm	Just the two of us, Dan Milea, MD, PhD	

4:40 pm – 5:00 pm	Turbulence fluid waves and the black hole , <i>Stella Y. Chung, MD, MS</i>	
5:00 pm – 5:15 pm	Closing Remarks	
5:30 pm – 6:00 pm	Walsh Committee Meeting	Veranda D
5:45 pm – 6:45 pm	Members in Training Reception (All students, residents and fellows-in-training are encouraged to attend.)	Veranda F

Monday, March 18

6:00 am – 6:45 am	Yoga	
6:30 am – 7:30 am	Breakfast	Charleston Ballroom
6:30 am – 7:30 am	NOVEL Editorial Board/Curriculum Committee Meeting	Veranda DE
7:30 am – 9:30 am	New Information I Should Know <i>Moderators: Christian Lueck, PhD, FRACP, FAAN and Claire Sheldon, MD, PhD</i>	Red Rock Ballroom

There have been enormous advances in neuroimmunology over the last two decades relating to both diagnosis and treatment of disease. For example, novel disease entities such as neuromyelitis optica spectrum disorder (NMOSD), chronic ataxic neuropathy, ophthalmoplegia, IgM monoclonal gammopathy, cold agglutinins and disialosyl antibodies (CANOMAD), and various autoimmune encephalitides have been described. Similarly, there has been an explosion of immunomodulatory therapies and monoclonal antibodies for the treatment of many conditions, some of which are autoimmune (e.g. multiple sclerosis and NMOSD), and some which are not (e.g. migraine). This session will provide an update of neuroimmunology as it relates to the practicing neuro-ophthalmologist. Following an introduction with an approach to the developing field of neuroimmunology, particular topics will include: 1) autoimmune encephalopathies 2) peripheral neuropathies 3) new treatments for multiple sclerosis and 4) novel immunomodulatory therapies for migraine.

Upon completion of this session, participants should be able to: 1) formulate a detailed framework of neuroimmunological disease 2) identify and describe neuroimmune diseases and 3) use immunotherapies appropriately.

7:30 am – 7:42 am	Neuro-Immunology, a new specialty- classifications of disorders , <i>Jeff Bennett, MD, PhD</i>	
7:42 am – 8:09 am	Autoimmune encephalitis: GFAP, DPPX, other , <i>Eric Eggenberger, DO, FAAN</i>	
8:09 am – 8:36 am	Ganglioside-related disorders (GQ1b; Miller-Fisher syndrome, CANOMAD) , <i>Umapathi Thirugnanam, MBBS</i>	
8:36 am – 9:03 am	New treatments for multiple sclerosis , <i>Sashank Prasad, MD</i>	
9:03 am – 9:30 am	New treatments for migraine , <i>Kathleen Digre, MD</i>	
9:30 am – 10:00 am	Coffee with Exhibitors	Charleston Ballroom

10:00 am – 12:00 pm

Hot Topics: How do I Treat?

Moderators: Vivek Patel, MD and Klara Landau, MD

This session is designed to provide the audience with a practical, evidence-based discussion of how to manage important clinical scenarios, which are of specific and contemporary interest to the neuro-ophthalmic community. Five “hot topics” will be presented by established experts and thought-leaders for the respective conditions. The chosen topics are important clinical scenarios. As a community, our understanding of how to optimally manage these challenging presentations is currently evolving.

Upon completion of this session, participants should be able to: 1) recognize the various etiologies of headache in IIH patients 2) distinguish MOG positive optic neuritis from other forms of optic neuritis and 3) identify possible treatment options for radiation induced optic neuropathy.

10:00 am – 10:24 am

Ischemic optic neuropathy from GCA, *Fiona Costello, MD, FRCP*

10:24 am – 10:48 am

Ocular myasthenia gravis, *Michael Lee, MD*

10:48 am – 11:12 am

MOG positive optic neuritis, *John Chen, MD, PhD*

11:12 am – 11:36 am

Headaches in IIH, *Deborah Friedman, MD, MPH*

11:36 am – 12:00 pm

Radiation optic neuropathy, *Norah Lincoff, MD*

12:00 pm – 1:00 pm

Lunch

Charleston Ballroom

12:00 pm – 1:00 pm

WIN (lunch provided)

Pavilion Ballroom

1:00 pm – 3:00 pm

Scientific Platform Session I

Red Rock Ballroom

1:00 pm - 1:15 pm

An Epidemiological Study of LHON Using a Large International Sample of Affected Individuals, *Alexander L. Pearson, BA*

1:15 pm - 1:30 pm

Neuro-ophthalmic manifestations of collapsin response-mediator protein-5 (CRMP5) autoimmune neuropathy, *Devon A. Cohen, MD*

1:30 pm - 1:45 pm

Associations between Pattern Electroretinogram and Intra-retinal Layer Thicknesses in Patients Multiple Sclerosis, *Hong Jiang*

1:45 pm - 2:00 pm

Presentation of NAION in a Global Treatment Trial, *Mark J. Kupersmith, MD*

2:00 pm - 2:15 pm

Characterization of Visual Pathway Abnormalities in Infants with Congenital Zika Syndrome using CT and MRI, *Amanda D. Henderson, MD*

2:15 - 2:30 pm

A Prospective Outcomes Study of Pediatric Optic Neuritis, *Stacy Pineles, MD, MS*

2:30 - 2:45 pm

Long-term OCT follow-up in Children with Optic Disc Drusen, *Lasse Malmqvist, MD, PhD*

2:45 - 3:00 pm

Progressive Neurodegeneration of the Retinal Nerve Fiber Layer in Veterans with Mild Traumatic Brain Injury, *Randy H. Kardon, MD, PhD*

3:00 pm - 5:00 pm

YONO Forum

Veranda DE

Tuesday, March 19

6:00 am – 6:45 am	Yoga	
6:30 am – 7:30 am	Breakfast	Charleston Ballroom
6:30 am – 7:30 am	JNO Editorial Board Meeting	Veranda AB
7:30 am – 10:00 am	Scientific Platform Session II	Red Rock Ballroom
7:30 am - 7:45 am	Adduction-induced deformations of the optic nerve head evokes peripapillary folds in papilledema, <i>Patrick A. Sibony, MD</i>	
7:45 - 8:00 am	Tree Shrew Spontaneous Retinal Venous Pulsation Changes Due to Changes in the Translaminar Pressure Difference, <i>Michael Dattilo, MD, PhD</i>	
8:00 - 8:15 am	Near Infrared Videography versus Direct Ophthalmoscopy for the Detection of Spontaneous Venous Pulsations, <i>Perry J. Thompson, BA</i>	
8:15 - 8:30 am	Quantitative Optical Coherence Tomography Angiography (OCTA) and Visual Field Defects in Idiopathic Intracranial Hypertension, <i>Melinda Chang, MD</i>	
8:30 - 8:45 am	Detection of Visual Loss in IIH with Static Automated Perimetry: Temporal Wedge Defects, <i>Michael Wall, MD</i>	
8:45 - 9:00 am	Artificial Intelligence for Detection and Classification of Abnormal Optic Discs on Fundus Photographs, <i>Dan Milea, MD, PhD</i>	
9:00 - 9:15 am	The Untuned Visuo-temporal Cortex in Patients with Visual Snow, <i>Ghislaine L. Traber, MD</i>	
9:15 - 9:30 am	Object recognition in acquired and developmental prosopagnosia: is it really just about faces? <i>Jason S. Barton, MD, PhD, FRCPC</i>	
9:30 - 9:45 am	eMULES in concussion: A quantitative 'look' at the eye movements, <i>Todd E. Hudson, PhD</i>	
9:45 - 10:00 am	Positional Testing In Acute Vestibular Syndrome: A Transversal And Longitudinal Study, <i>Joao Lemos, MD, PhD</i>	
10:00 am - 10:30 am	Coffee with Exhibitors	Charleston Ballroom
10:30 am – 12:30 pm	Scientific Platform Session III	Red Rock Ballroom
10:30 am - 10:45 am	rAAV2/2-ND4 Treatment of Leber Optic Neuropathy: 72-Week Data from the REVERSE Phase III Clinical Trial, <i>Nancy Newman, MD</i>	
10:45 am - 11:00 am	Efficacy of chronic immunotherapy for myelin oligodendrocyte glycoprotein-IgG disease, <i>John J. Chen, MD, PhD</i>	
11:00 am - 11:15 am	Amnion-derived Multipotent Progenitor Cells Attenuate Optic Nerve and Spinal Cord Demyelinating Disease, <i>Kenneth S. Shindler, MD, PhD</i>	
11:15 am - 11:30 am	MEK inhibitor treatment promotes retinal ganglion cell preservation without preventing retrobulbar demyelination in neurofibromatosis mice, <i>Steven F. Stasheff, MD, PhD</i>	
11:30 am - 11:45 am	Melanopsin: targeted ectopic expression for optogenetic visual restoration, <i>Michael J. Gilhooley, MA, MB, BChir, FRCOphth</i>	
11:45 am - 12:00 pm	The Stressed Optic Nerve at High Altitude and Treatment with Chemical Chaperon, <i>Yaping (Joyce) Liao, MD, PhD</i>	

12:00 pm - 12:15 pm	Physiologic Electrical Fields Direct Retina Ganglion Cell Axon Growth, <i>Kimberly K. Gokoffski, MD, PhD</i>	
12:15 pm - 12:30 pm	Visual Impairment in Patients with Giant Cell Arteritis Treated with Tocilizumab in Real-World Clinical Practice, <i>Timothy J. McCulley, MD</i>	
12:30 pm - 1:00 pm	Lunch	Charleston Ballroom
1:00 pm – 3:00 pm	Poster Session II: Scientific Advancements	Red Rock Ballroom A-C
1:00 - 2:00 pm	Odd Numbered Posters	
2:00 - 3:00 pm	Even Numbered Posters	
3:00 pm – 4:00 pm	Abstract Committee Meeting	Veranda D

Wednesday, March 20

6:30 am – 7:30 am	Breakfast	Charleston Ballroom
6:30 am – 7:30 am	CME Committee Meeting	Veranda D
7:30 am – 9:30 am	Retinal Microvascular Changes and Neurologic Disorders <i>Moderators: Beau Bruce, MD, PhD and Oana Dumitrascu, MD, MSc</i> <i>Invited Speaker: Tien Yin Wong, MBBS, MMED, MPH, PhD, FRCSE, FRANZCO, FAMS</i>	Red Rock Ballroom

Retinal microvascular changes are increasingly recognized as diagnostic and prognostic indicators in neurologic diseases. In this session, a comprehensive overview of the epidemiology of retinal microvascular changes in relation to acute and chronic neurologic diseases will be reviewed and established and developing methodologies of evaluating those changes will be discussed. Latest advances and current challenges behind their implementation in routine clinical practice will be addressed.

Upon completion of this session, participants should be able to: 1) describe the diagnostic and prognostic significance of retinal microvascular changes in acute and chronic neurologic diseases, 2) discuss state-of-the-art concepts in hypertensive retinopathy and 3) describe current and emerging technologies for evaluating the retinal microvasculature.

7:30 am - 7:45 am	Retinal Vascular Changes in Acute Neurological Disorders, <i>Beau Bruce, MD, PhD</i>	
7:45 am - 8:25 am	Current Concepts in Retinal Vascular Imaging, <i>Tien Yin Wong, MBBS, MMED, MPH, PhD, FRCSE, FRANZCO, FAMS</i>	
8:25 am - 8:40 am	Retinal Vascular Abnormalities in Cerebrovascular and Neurodegenerative Disorders, <i>Oana Dumitrascu, MD, MSc</i>	
8:40 am - 9:00 am	Artificial intelligence in Retinal Imaging, <i>Tien Yin Wong, MD, PhD, MBBS, MMED, MPH, PhD, FRCSE, FRANZCO, FAMS</i>	
9:00 am - 9:30 am	Q&A	
9:30 am – 10:00 am	Coffee with exhibitors	Charleston Ballroom

10:00 am – 11:25 am **Dizziness, vertigo: just tell me what to do!** **Red Rock Ballroom**
Moderators: Dan Gold, DO and David Newman-Toker, MD, PhD

This session will provide a practical approach to the diagnosis and treatment of patients with vestibular disorders. The session will be separated into two parts – dizziness & vertigo in the emergency department and dizziness & vertigo in the clinic. The most common vestibular disorders in each setting will be discussed, with a particular focus on how the history should be approach in addition to the role of the bedside ocular-motor and vestibular examination.

Upon completion of this session, participants should be able to: 1) describe the HINTS exam and its correct application 2) interpret results of the HINTS exam correctly, including central and peripheral patterns 3) apply the diagnostic Dix-Hallpike and supine roll positional maneuvers 4) interpret positionally-triggered nystagmus to localize the affected canal 5) describe the Triage-TiTrATE-Test method and 6) apply the Triage-TiTrATE-Test method to correctly diagnose the etiology of dizziness or vertigo.

10:00 am - 10:30 am	Dizziness & Vertigo in the ED - When to Worry, When to Image, When to Admit, <i>David Newman-Toker, MD, PhD</i>
10:30 am - 11:15 am	Dizziness & Vertigo in the Clinic - When to Test, When to Treat, When to Refer, <i>Dan Gold, DO</i>
11:15 am - 11:25 am	Q&A

11:25 am – 12:00 pm **Jacobson Lecture: Leber hereditary optic neuropathy: From bedside to bench to bedside** **Red Rock Ballroom**
Speaker: Nancy Newman, MD

This lecture will trace the story of our growing understanding of Leber hereditary optic neuropathy (LHON) from clinical recognition, to the first demonstration of a point mutation in the mitochondrial DNA associated with a human disease, to ground-breaking attempts at gene therapy.

Upon completion of this session, participants should be able to: 1) recognize the various clinical phenotypes associated with Leber hereditary optic neuropathy (LHON) 2) apply the appropriate testing to make the diagnosis of LHON and 3) identify the potential treatment options for LHON.

12:00 pm – 12:30 pm	Announcements/JNO/NOVEL Updates	Red Rock Ballroom
12:30 pm- 2:00 pm	Lunch Break	
12:30 pm- 2:00 pm	Research Committee Luncheon	Veranda AB
2:00 pm – 3:45 pm	EOM/Vestibular Testing Skills Transfer	Red Rock Ballroom

This session will provide a practical ocular-motor/vestibular hands-on experience. With the help of NANOS members with expertise in the field, there will be 8 stations for the following: VOR testing, Positional Testing of Posterior Semicircular Canals, Positional Testing of Horizontal Semicircular Canals, Provocative Testing (nystagmus elicitation), Gaze Testing (ocular alignment, saccades, smooth ocular pursuit, and smooth eye-head tracking), Nystagmus Interpretation, Peds Eye Movement, and Cases.

Upon completion of this session, participants should be able to: 1) perform the HINTS exam (head impulse [VOR], nystagmus [naming and interpretation], test of skew [alignment]) 2) perform other

ocular motor (saccades, pursuit, eye-head tracking) and provocative testing (head-shaking) to aid in localization 3) apply the diagnostic Dix-Hallpike and supine roll positional maneuvers with proper technique and 4) select the most appropriate therapeutic maneuver and apply this treatment.

2:00 pm - 3:45 pm

Headache Medicine Pavilion Ballroom
Update- What a Neuro-ophthalmologist Needs to Know

There is a large overlap between neuro-ophthalmology and headache medicine. Advances in the understanding of migraine pathophysiology have evolved from bench to bedside with novel medications and devices for patient care. This session will review relevant migraine pathophysiology, focusing on calcitonin gene-related peptide (GCRP) and anatomic pathways targeted by neuromodulation devices, discuss the evidence of efficacy of agents targeting GCRP and neuromodulation devices in the treatment of migraine and cluster headache, and update attendees on visual snow, eye pain and photophobia.

Upon completion of this session, participants should be able to: 1) describe the role of calcitonin-gene related peptide (CGRP) in the pathogenesis of migraine and cluster headache 2) recommend new treatments and devices to patients as appropriate 3) list ophthalmic and neurologic causes of photophobia and 4) explain the role of intrinsically photosensitive retinal ganglion cells in the pathophysiology of photophobia.

3:45 pm – 5:30 pm

Reading an OCT like Red Rock Ballroom
we read an MRI

OCT is capable of the highest resolution images of the retina and optic nerve clinically available of the eye, yet when clinicians examine its output, they frequently rely upon a few quantitative measures to determine whether the nerve fiber layer or ganglion cell complex is thinning or thickening. Reviewing the automated segmentation, signal strength and centering of the study and how they may compare to prior studies is critical, as is looking at where the retinal vessels enter the disc when trying to understand local nerve fiber layer thickness as the nerve fiber layer follows the retinal vessels embryologically. The examination of the visual field side by side with the OCT of the nerve fiber layer and ganglion cell complex lends authority to conclusions when they reinforce one another. The recognition of papilledema from its OCT appearance and its separation from other causes of disc swelling e.g. drusen, NAION, optic nerve meningioma and hypotony will be addressed and the importance of the peripapillary RPE Burch's membrane conformation on axial OCTs and the recognition of folds on in face images.

3:45 pm - 5:30 pm

Worldwide wonders: Pavilion Ballroom
cases defining the international language of Neuro-ophthalmology

In this global community, where travel to and from countries outside America is becoming more frequent, it is increasingly likely that doctors will be seeing patients with diseases that would otherwise not be common in their country or have a different phenotype to those typically seen in one's locality. This session is designed to introduce five conditions where regional differences may make a difference in the recognition or management of the condition.

Each presenter will highlight a challenging case from their practice, update us on the current thoughts of how to diagnose, investigate and manage that condition and highlight regional differences.

Upon completion of this session, participants should be able to: 1) recognize and distinguish five common diseases that affect the central nervous system and eye 2) plan an appropriate series of investigations and evaluate the results and 3) recommend a treatment plan.

6:30 pm – 12:00 am

Banquet

**Red Rock and
Charleston Ballrooms**

Join colleagues for a fun, casual evening of socializing, dining and dancing at the NANOS Annual Banquet! Dinner will take place in the Red Rock Ballroom, followed by dancing in the Charleston Ballroom. This event is complimentary for registered attendees; guests must purchase tickets for \$100 per person.

Thursday, March 21

6:30 am – 7:30 am

Breakfast

Charleston Ballroom

7:30 am – 9:30 am

**How do I Evaluate? Adult versus kid:
Does it Matter?**

Red Rock Ballroom

Moderator: Stacy Pineles, MD, MS and Tony Arnold, MD

This session will focus on the management of four neuro-ophthalmic disorders (Horner syndrome, isolated optic neuritis, 3rd cranial nerve palsy, and papilledema) that occur both in pediatric and adult patients. For each topic, an expert for each age group will discuss management, with recommendations based on recent literature and highlight new or controversial data.

Upon completion of this session, participants should be able to: 1) recognize key differences in differential diagnosis 2) utilize correct diagnostic modalities and 3) apply age-appropriate treatments.

7:30 am – 8:00 am

Horner syndrome, *Aki Kawasaki, MD, PhD and Grant Liu, MD*

8:00 am – 8:30 am

Isolated optic neuritis, *Chris Glisson, DO, MS and Jason Peragallo, MD*

8:30 am – 9:00 am

Third nerve palsy, *Karl Golnik, MD, MEd and Paul Phillips, MD*

9:00 am – 9:30 am

Papilledema, *Collin McClelland, MD and Robert Avery, DO, MSCE*

9:30 am – 10:00 am

Coffee break

Charleston Ballroom

10:00 am – 12:00 pm

**Current concepts in eye movement disorders
In kids: Case-based potpourri**

Red Rock Ballroom

Moderators: Mark Borchert, MD and Gena Heidary, MD, PhD

This session will review current concepts in strabismus and gaze abnormalities in pediatric patients. The session will focus on providing a framework for differentiating amongst supranuclear, neuromuscular, genetic, and mechanical causes of strabismus. Specifically, we seek to provide novel insights into pathophysiology of disease, genetic classifications of disease, and the nuances of the clinical presentation which will promote a deeper understanding of eye movement disorders in children. Topics will cover essential infantile esotropia, congenital oculomotor apraxia, Duane syndrome, congenital

cranial dysinnervation disorders, Moebius syndrome, and neuromuscular diseases that affect oculomotor function in children.

Upon completion of this session, participants should be able to: 1) differentiate amongst supranuclear, neuromuscular, and mechanical etiologies of pediatric strabismus and 2) apply the appropriate diagnostic testing regarding each and 3) describe novel concepts underlying infantile strabismus.

10:00 am - 10:20 am	Essential Infantile Esotropia , <i>Michael Brodksy, MD</i>
10:20 am - 10:35 am	Congenital Oculomotor Apraxia , <i>Jane Edmond, MD</i>
10:35 am - 10:50 am	Duane Syndrome , <i>Mark Borchert, MD</i>
10:50 am - 11:10 am	Congenital Cranial Dysinnervation Disorders , <i>Gena Heidary, MD, PhD</i>
11:10 am - 11:25 am	Moebius Syndrome , <i>Shannon Beres, MD</i>
11:25 am - 11:45 am	Neuromuscular Disorders affecting Eye Movement in Children , <i>Veeral Shah, MD, PhD</i>
11:45 am - 12:00 pm	Panel Discussion and Audience Questions