

# PROGRAM

## SATURDAY, MARCH 16

8:00 am – 12:00 pm	NANOS Board Meeting.....	Veranda DE
2:00 pm – 7:30 pm	Registration/Help Desk .....	5th floor Registration Desk
3:00 pm – 4:30 pm	Orbital and Sellar Lesions-Neuro-Radiology Pearls and Pitfalls .....	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 pm – 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	Yoga .....	Pavilion Ballroom
6:30 am – 7:30 am	Breakfast.....	Charleston Ballroom
6:30 am – 5:30 pm	Registration/Help Desk .....	5th floor Registration Desk
7:30 am – 9:30 am	Frank B. Walsh (I) .....	Red Rock Ballroom

*Co-Chairs: Madhura Tamhankar, MD and Grant Liu, MD*

*Walsh Committee: Kenneth Shindler, MD, PhD, Robert Avery, DO, MSCE,*

*Ahmara Ross, MD, PhD, and Ali Hamedani, MD, MHS*

*Neuro-radiologist: Laurie Loevner, MD*

*Neuro-pathologist: Zissimos Mourelatos, MD*

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.

## SUNDAY, MARCH 17 (Continued)

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.

*Moderators: Kenneth Shindler, MD, PhD and Ahmara Ross, MD, PhD*

7:30 am – 7:45 am	<b>Welcome and Intro to Mobile App</b>	
7:45 am – 8:05 am	<b>A Zebra Among Zebras</b> , Peter W. Mortensen, MD	
8:05 am – 8:25 am	<b>The Great Masquerade</b> , Bart K. Chwalisz, MD	
8:25 am – 8:45 am	<b>Chalky Pallid Edema</b> , Daniel L. Kornberg, MD	
8:45 am – 9:05 am	<b>A-deno What's Going On!</b> Christine Greer, MD	
9:00 am – 9:25 am	<b>Go with your Gut Feeling</b> , Paul R. Freund, MD, MSc, FRCSC	
9:25 am – 9:30 am	<b>Wrap-up</b>	
<b>9:30 am – 10:00 am</b>	<b>Coffee break</b> .....	<b>Charleston Ballroom</b>
<b>10:00 am – 12:00 pm</b>	<b>Frank B. Walsh (II)</b> .....	<b>Red Rock Ballroom</b>
	<i>Moderators: Grant Liu, MD and Robert Avery, DO, MSCE</i>	
10:00 am – 10:20 am	<b>Fire and Ice</b> , Mary D. Maher, MD	
10:20 am – 10:40 am	<b>Unexplained Becomes Explained</b> , Jinu Han, MD	
10:40 am – 11:00 am	<b>A Trip Through the Wormhole</b> , Anne Kao, MD	
11:00 am – 11:20 am	<b>Three's a Crowd</b> , Kanwal S. Matharu, MD	
11:20 am – 11:40 am	<b>Don't Drink the Water</b> , Devon A. Cohen, MD	
11:40 am – 11:45 am	<b>Morning Wrap-up</b>	
<b>12:00 pm – 12:30 pm</b>	<b>Lunch</b> .....	<b>Charleston Ballroom</b>
<b>12:00 pm – 1:00 pm</b>	<b>Fellowship Directors Committee Meeting</b> .....	<b>Veranda AB</b>
<b>12:30 pm – 1:00 pm</b>	<b>International Relations Committee Meeting</b> .....	<b>Veranda E</b>
<b>12:30 pm – 2:30 pm</b>	<b>Poster Session I: Clinical Highlights</b> .....	<b>Red Rock Ballroom A-C</b>
12:30 pm – 1:30 pm	<b>Odd Numbered Posters</b>	
1:30 pm – 2:30 pm	<b>Even Numbered Posters</b>	
<b>2:30 pm – 3:00 pm</b>	<b>Business Meeting</b> .....	<b>Red Rock Ballroom</b>
<b>3:00 pm – 5:15 pm</b>	<b>Frank B. Walsh (III)</b> .....	<b>Red Rock Ballroom</b>
	<i>Moderators: Madhura Tamhankar, MD and Ali Hamedani, MD, MHS</i>	
3:00 pm – 3:20 pm	<b>Every Rose Has Its Thorn</b> , William J. Anderson, BS	
3:20 pm – 3:40 pm	<b>Not the Rolling Stones</b> , Ari A. Shemesh, MD	
3:40 pm – 4:00 pm	<b>Foiled Thrice</b> , Jonathan A. Micieli, MD, CM	
4:00 pm – 4:20 pm	<b>At the Crossroads</b> , Konstantinos Douglas, MD, DVM, MBA	
4:20 pm – 4:40 pm	<b>Just the Two of Us</b> , Dan Milea, MD, PhD	
4:40 pm – 5:00 pm	<b>Turbulence Fluid Waves and the Black Hole</b> , Stella Y. Chung, MD, MS	
5:00 pm – 5:15 pm	<b>Closing Remarks</b>	
<b>5:30 pm – 6:00 pm</b>	<b>Walsh Committee Meeting</b> .....	<b>Veranda D</b>
<b>5:45 pm – 6:45 pm</b>	<b>Members-in-Training Reception</b> .....	<b>Veranda F</b>
	(All students, residents and fellows-in-training are encouraged to attend.)	



**MONDAY, MARCH 18**

<b>6:00 am – 6:45 am</b>	<b>Yoga</b> .....	<b>Veranda DE</b>
<b>6:30 am – 7:30 am</b>	<b>Breakfast</b> .....	<b>Charleston Ballroom</b>
<b>6:30 am – 7:30 am</b>	<b>Breakfast with the Novices</b> .....	<b>Charleston Ballroom</b>

Join us in the reserved YONO area at breakfast for table discussions led by senior members and /or YONOs to discuss topics relevant to aspiring or current YONOs.

<b>6:30 am – 5:00 pm</b>	<b>Registration/Help Desk</b> .....	<b>5th floor Registration Desk</b>
<b>6:30 am – 7:30 am</b>	<b>NOVEL/Editorial Board/Curriculum Committee Meeting</b> .....	<b>Veranda AB</b>
<b>7:30 am – 9:30 am</b>	<b>New Information I Should Know</b> .....	<b>Red Rock Ballroom</b>

*Moderators: Christian Lueck, PhD, FRACP, FAAN and Claire Sheldon, MD, PhD*

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 neuro-immunological disease 2) identify and describe neuroimmune diseases and 3) use immunotherapies appropriately.

<b>7:30 am – 7:42 am</b>	<b>Neuro-Immunology, a New Specialty - Classifications of Disorders</b> , <i>Jeffrey Bennett, MD, PhD</i>
<b>7:42 am – 8:09 am</b>	<b>Autoimmune Encephalitis: GFAP, DPPX, Other</b> , <i>Eric Eggenberger, DO</i>
<b>8:09 am – 8:36 am</b>	<b>Ganglioside-Related Disorders (GQ1b; Miller-Fisher Syndrome; CANOMAD)</b> , <i>Umapathi Thirugnanam, MBBS</i>
<b>8:36 am – 9:03 am</b>	<b>New Treatments for Multiple Sclerosis</b> , <i>Sashank Prasad, MD</i>
<b>9:03 am – 9:30 am</b>	<b>New Treatments for Migraine</b> , <i>Kathleen Digre, MD</i>

<b>9:30 am – 10:00 am</b>	<b>Coffee with Exhibitors</b> (with support from EMD Serono) .....	<b>Charleston Ballroom</b>
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## MONDAY, MARCH 18 (Continued)

**10:00 am – 12:00 pm**      **Hot Topics: How do I Treat?..... Red Rock Ballroom**  
*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- IgG 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) - LeadHERship: A Call to Thought and Action..... Pavilion Ballroom**

Please join the Women in Neuro-Ophthalmology (WIN) for an exciting networking event. Dr. Kimberly Winges will share what she learned through the inaugural NANOS Pilot Grant for Leadership Development, followed by small group discussions regarding leadership and empowerment in the workplace. All are welcome!

**1:00 pm – 3:00 pm**      **Scientific Platform Session I..... Red Rock Ballroom**  
*Moderators: Melinda Chang, MD and Timothy J. McCulley, MD*

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 pm – 2:30 pm      **A Prospective Outcomes Study of Pediatric Optic Neuritis, Stacy Pineles, MD, MS**  
 2:30 pm – 2:45 pm      **Long-term OCT Follow-up in Children with Optic Disc Drusen, Lasse Malmqvist, MD, PhD**  
 2:45 pm – 3:00 pm      **Progressive Neurodegeneration of the Retinal Nerve Fiber Layer in Veterans with Mild Traumatic Brain Injury, Randy H. Kardon, MD, PhD**

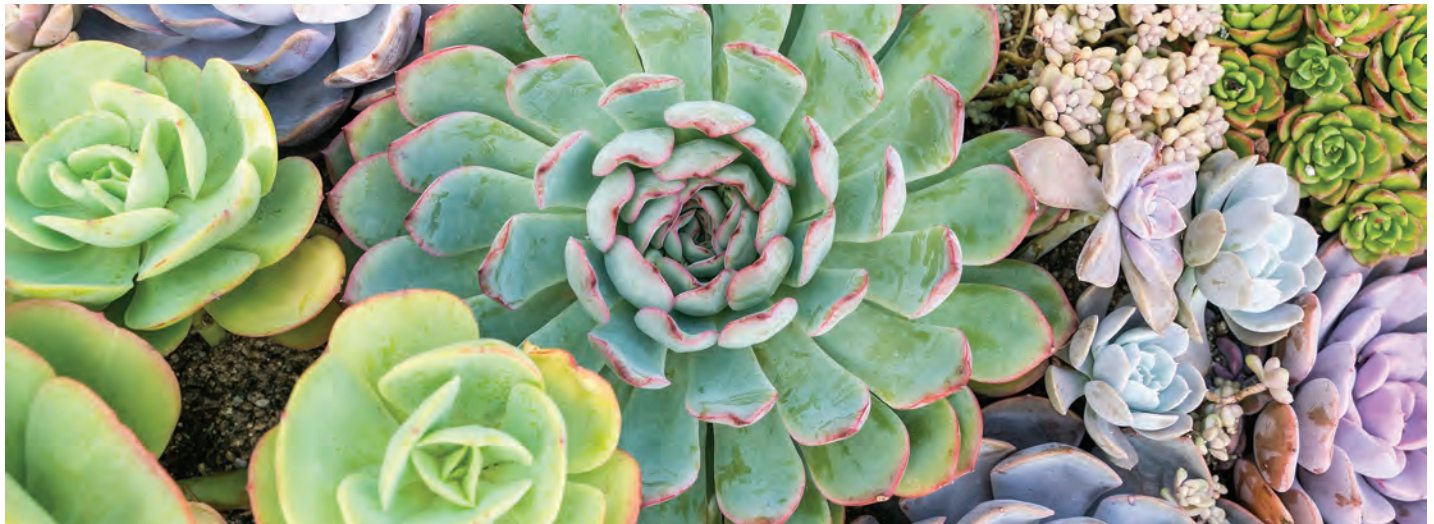
**3:00 pm – 5:00 pm**      **YONO Forum ..... Pavilion Ballroom**

All are welcome to attend this 2 hour session catering to students, residents, fellows and neuro-ophthalmologists in the early years of their career. The first hour will consist of brief 10 minute prepared talks delivered by knowledgeable speakers in the field of neuro-ophthalmology on topics of interest for aspiring neuro-ophthalmologists and young neuro-ophthalmologists. The next hour will include small group discussions led by these same speakers allowing participants more time to ask questions.

**3:15 pm**      **Optional Excursions (advanced registration required)**  
**3:15 pm – 6:30 pm**      **NANOS Race Car Experience Fundraiser (advanced registration required)**

A once-in-a-lifetime opportunity to ride in a Porsche GT3 Cup race car at the Las Vegas Motor Speedway. Powered by Dr. Preston Calvert, Neuro-Ophthalmologist and professional race car driver. Funds raised at this event will support NANOS educational offerings.

1 lap - \$75    2 lap - \$125    3 lap - \$175    Video recording of the race - \$20



**TUESDAY, MARCH 19**

6:00 am – 6:45 am	Yoga ..... Veranda DE
6:30 am – 7:30 am	Breakfast..... Charleston Ballroom
6:30 am – 5:00 pm	Registration/Help Desk .....5th floor Registration Desk
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
	<i>Moderators: Michael Vaphiades, DO and Kimberly K. Gokoffski, MD, PhD</i>
7:30 am – 7:45 am	<b>Adduction-induced Deformations of the Optic Nerve Head Evokes Peripapillary Folds in Papilledema, Patrick A. Sibony, MD</b>
7:45 am – 8:00 am	<b>Tree Shrew Spontaneous Retinal Venous Pulsation Changes Due to Changes in the Translaminar Pressure Difference, Michael Dattilo, MD, PhD</b>
8:00 am – 8:15 am	<b>Near Infrared Videography versus Direct Ophthalmoscopy for the Detection of Spontaneous Venous Pulsations, Perry J. Thompson, BA</b>
8:15 am – 8:30 am	<b>Quantitative Optical Coherence Tomography Angiography (OCTA) and Visual Field Defects in Idiopathic Intracranial Hypertension, Melinda Chang, MD</b>
8:30 am – 8:45 am	<b>Detection of Visual Loss in IIH with Static Automated Perimetry: Temporal Wedge Defects, Michael Wall, MD</b>
8:45 am – 9:00 am	<b>Artificial Intelligence for Detection and Classification of Abnormal Optic Discs on Fundus Photographs, Dan Milea, MD, PhD</b>
9:00 am – 9:15 am	<b>The Untuned Visuo-temporal Cortex in Patients with Visual Snow, Ghislaine L. Traber, MD</b>
9:15 am – 9:30 am	<b>Object Recognition in Acquired and Developmental Prosopagnosia: Is it Really Just About Faces? Jason S. Barton, MD, PhD, FRCPC</b>
9:30 am – 9:45 am	<b>eMULES in concussion: A quantitative ‘Look’ at the Eye Movements, Todd E. Hudson, PhD</b>
9:45 am – 10:00 am	<b>Positional Testing in Acute Vestibular Syndrome: A Transversal and Longitudinal Study, Joao Lemos, MD, PhD</b>
10:00 am – 10:30 am	<b>Coffee with Exhibitors (with support from EMD Serono) ..... Charleston Ballroom</b>
10:30 am – 12:30 pm	<b>Scientific Platform Session III..... Red Rock Ballroom</b>
	<i>Moderators: Jeffrey Bennett, MD, PhD and Heather Moss, MD, PhD</i>
10:30 am – 10:45 am	<b>rAAV2/2-ND4 Treatment of Leber Optic Neuropathy: 72-Week Data from the REVERSE Phase III Clinical Trial, Nancy Newman, MD</b>
10:45 am – 11:00 am	<b>Efficacy of Chronic Immunotherapy for Myelin Oligodendrocyte Glycoprotein-IgG Disease, John J. Chen, MD, PhD</b>
11:00 am – 11:15 am	<b>Amnion-derived Multipotent Progenitor Cells Attenuate Optic Nerve and Spinal Cord Demyelinating Disease, Kenneth S. Shindler, MD, PhD</b>

# PROGRAM

## TUESDAY, MARCH 19 (Continued)

- 11:15 am – 11:30 am    **MEK Inhibitor Treatment Promotes Retinal Ganglion Cell Preservation without Preventing Retrobulbar Demyelination in Neurofibromatosis Mice**, *Steven F. Stasheff, MD, PhD*
- 11:30 am – 11:45 am    **Melanopsin: Targeted Ectopic Expression for Optogenetic Visual Restoration**,  
*Michael J. Gilhooley, MA, MB, BChir, FRCOphth*
- 11:45 am – 12:00 pm    **The Stressed Optic Nerve at High Altitude and Treatment with Chemical Chaperon**,  
*Yaping (Joyce) Liao, MD, PhD*
- 12:00 pm – 12:15 pm    **Physiologic Electrical Fields Direct Retina Ganglion Cell Axon Growth**,  
*Kimberly K. Gokoffski, MD, PhD*
- 12:15 pm – 12:30 pm    **Visual Impairment in Patients with Giant Cell Arteritis Treated with Tocilizumab in Real-World Clinical Practice**, *Timothy J. McCulley, MD*

**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 pm – 2:00 pm            **Odd Numbered Posters**

2:00 pm – 3:00 pm            **Even Numbered Posters**

**3:00 pm – 4:00 pm**            **Abstract Committee Meeting** ..... **Veranda D**

**3:15 pm**                         **Optional Excursions (advanced registration required)**

**4:15 pm – 5:15 pm**            **Consortium of Pediatric Neuro-Ophthalmologists Meeting (CPNO) -**

**All are welcome to attend** ..... **Veranda AB**

*Facilitator: Paul Phillips, MD*



## WEDNESDAY, MARCH 20

**6:30 am – 7:30 am**            **Breakfast**..... **Charleston Ballroom**

**6:30 am – 7:30 am**            **Breakfast with the Novices**..... **Charleston Ballroom**

Join us in the reserved YONO area at breakfast for table discussions led by senior members and /or YONOs to discuss topics relevant to aspiring or current YONOs.

**6:30 am – 7:30 am**            **CME Committee Meeting** ..... **Veranda D**

**6:30 am – 5:30 pm**            **Registration/Help Desk** ..... **5th floor Registration Desk**

**7:30 am – 9:30 am**                    **Retinal Microvascular Changes and Neurologic Disorders** ..... **Red Rock Ballroom**  
*Moderators: Beau Bruce, MD, PhD and Oana Dumitrascu, MD, MSc*  
*Invited Speaker: Tien Yin Wong, MD, MBBS, MMED (Ophth), MPH, PhD, FRCSE, FRANZCO, FAMS*

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	<b>Retinal Vascular Changes in Acute Neurological Disorders</b> , <i>Beau Bruce, MD, PhD</i>
7:45 am – 8:25 am	<b>Current Concepts in Retinal Vascular Imaging</b> , <i>Tien Yin Wong, MD, MBBS, MMED (Ophth), MPH, PhD, FRCSE, FRANZCO, FAMS</i>
8:25 am – 8:40 am	<b>Retinal Vascular Abnormalities in Cerebrovascular and Neurodegenerative Disorders</b> , <i>Oana Dumitrascu, MD, MSc</i>
8:40 am – 9:00 am	<b>Artificial Intelligence in Retinal Imaging</b> , <i>Tien Yin Wong, MD, MBBS, MMED (Ophth), MPH, PhD, FRCSE, FRANZCO, FAMS</i>
9:00 am – 9:30 am	<b>Q&amp;A</b>

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

**11:25 am – 12:00 pm**                    **Jacobson Lecture: Leber Hereditary Optic Neuropathy:  
from Bedside to Bench to Bedside**..... **Red Rock Ballroom**  
*Speaker: Nancy J. 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.

## WEDNESDAY, MARCH 20 *(Continued)*

**12:00 pm – 12:30 pm**      **Announcements/JNO/NOVEL Updates ..... Red Rock Ballroom**

12:00 pm – 12:05 pm      **Announcements, Valerie Biousse, MD**  
 12:05 pm – 12:15 pm      **JNO Update, Laura Balcer, MD**  
 12:15 pm – 12:25 pm      **NOVEL Update, Kathleen Digre, MD**

**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 (advanced registration required - sold out)..... Red Rock Ballroom**  
*Moderators: Dan Gold, DO and David Newman-Toker, MD, PhD*  
*Facilitators: Shannon Beres, MD, Anthony Brune, DO, Marc Dinkin, MD, Eric Eggenberger, DO, Christopher Glisson, DO, MS, Joao Lemos, MD, PhD, Jorge Kattah, MD, Luis Mejico, MD, Mark Morrow, MD, Mark Moster, MD, Kannan Narayana, MD, MBBS, Sashank Prasad, MD, John Pula, MD, Veeral Shah, MD, PhD, Caroline Tilikete, MD, PhD, and Konrad P. Weber, MD*

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: 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 Update - What a Neuro-Ophthalmologist Needs to Know ..... Pavilion Ballroom**

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.

2:00 pm – 2:25 pm      **Who, What, and Where: Insights into Migraine Pathophysiology and New Therapeutic Targets,**  
*Benjamin Frishberg, MD*  
 2:25 pm – 2:55 pm      **Designer Drugs and Neuromodulation for Migraine and Cluster Headache,**  
*Deborah Friedman, MD MPH*  
 2:55 pm – 3:35 pm      **Clinical Conundrums in Migraine: Eye Pain, Photophobia, and Visual Snow,**  
*Kathleen Digre, MD*  
 3:35 pm – 3:45 pm      **Q&A**



**3:45 pm – 5:30 pm            Reading an OCT Like We Read an MRI ..... Red Rock Ballroom**

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.

Upon completion of this session, participants should be able to: 1) read an OCT like a radiologist reads an MRI 2) distinguish amongst swollen discs when interpreting an OCT and 3) recognize retinal patterns in an OCT.

- 3:45 pm – 3:50 pm            **Welcome and Introduction, Jeffrey G. Odel, MD**
- 3:50 pm – 4:30 pm            **Reading an OCT Like We Read an MRI, Donald Hood, PhD**
- 4:30 pm – 5:10 pm            **Transverse Axial / en Face OCT in the Assessment of Optic Disc Ddema and Pseudopapilledma, Patrick A. Sibony, MD**
- 5:10 pm – 5:25 pm            **Cases, Jeffrey G. Odel, MD**
- 5:25 pm – 5:30 pm            **Q&A**

**3:45 pm – 5:30 pm            Worldwide Wonders: Cases Defining the International Language of Neuro-Ophthalmology ..... Pavilion Ballroom**  
*Moderators: Clare Fraser, FRANZCO and Susan Mollan, FRCOphth*

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.

- 3:45 pm – 3:50 pm            **Introduction**
- 3:50 pm – 4:15 pm            **Optic Neuritis: a Worldwide View, Simon Hickman, PhD, FRCP**
- 4:15 pm – 4:40 pm            **Two Cases from a Tick Country, Steffen Hamann, MD, PhD**
- 4:40 pm – 5:05 pm            **In Vitreous Veritas, Pedro Fonseca, MD**
- 5:05 pm – 5:30 pm            **Non-idiopathic Intracranial Hypertension with Happy Ending, Ruth Huna-Baron, MD**

**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

<b>6:30 am – 7:30 am</b>	<b>Breakfast.....</b>	<b>Charleston Ballroom</b>
<b>6:30 am – 12:00 pm</b>	<b>Registration/Help Desk .....</b>	<b>5th floor Registration Desk</b>
<b>7:30 am – 9:30 am</b>	<b>How Do I Evaluate? Adult versus Kid: Does it Matter? .....</b>	<b>Red Rock Ballroom</b>
	<i>Moderator: Stacy Pineles, MD, MS and Anthony Arnold, MD</i>	

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	<b>Horner Syndrome, Aki Kawasaki, MD, PhD and Grant Liu, MD</b>
8:00 am – 8:30 am	<b>Isolated Optic Neuritis, Christopher Glisson, DO, MS and Jason Peragallo, MD</b>
8:30 am – 9:00 am	<b>Third Nerve Palsy, Karl Gornik, MD, MEd and Paul Phillips, MD</b>
9:00 am – 9:30 am	<b>Papilledema, Collin McClelland, MD and Robert Avery, DO, MSCE</b>

<b>9:30 am – 10:00 am</b>	<b>Coffee break.....</b>	<b>Charleston Ballroom</b>
<b>10:00 am – 12:00 pm</b>	<b>Current Concepts in Eye Movement Disorders in Kids: Case-based Potpourri.....</b>	<b>Red Rock Ballroom</b>
	<i>Moderators: Mark Borchert, MD and Gena Heidary, MD, PhD</i>	

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	<b>Essential Infantile Esotropia, Michael Brodsky, MD</b>
10:20 am – 10:35 am	<b>Congenital Ocular Motor Apraxia, Jane Edmond, MD</b>
10:35 am – 10:50 am	<b>Duane Syndrome, Mark Borchert, MD</b>
10:50 am – 11:10 am	<b>Congenital Cranial Dysinnervation Disorders, Gena Heidary, MD, PhD</b>
11:10 am – 11:25 am	<b>Moebius Syndrome, Shannon Beres, MD</b>
11:25 am – 11:45 am	<b>Neuromuscular Disorders, Veeral Shah, MD, PhD</b>
11:45 am – 12:00 pm	<b>Panel Discussion and Audience Questions</b>