National Science Education Leadership Association

Summer Leadership Institute

Dimensions and Dynamos:
Leading for Success in a Transitional Era of New Standards and Technology

June 28-July 1, 2017

Omaha's Henry Doorly Zoo & Aquarium
3701 S. 10th Street
Omaha, NE 68107
402.733.8401
www.OMAHAZOO.com
Welcome to the 2017 NSELA Summer Leadership Institute
Dimensions and Dynamos:
Leading for Success in a Transitional Era
of New Standards and Technology

On behalf of the National Science Education Leadership Association (NSELA), I want to welcome you to sunny Omaha and the 2017 NSELA Summer Leadership Institute. We are pleased to provide science education leaders the time, space and opportunity to collaborate, learn and support one another in this time of change. We have an exciting slate of speakers and facilitators to work with us over the next few days.

The focus of our work will be braiding together three important facets of the work for science leadership:

Cultivating Three Dimensional Learning In States, Districts and Schools (with NSTA) Led by National Science Teachers Association experts, Ted Willard and Susan Koba, this strand will advance all science leaders’ understanding of three dimensional learning and its place in every science educator’s classroom.

Leadership in Aligning Technology with Standards-based Learning. This strand focuses on essential principles of cutting-edge research that informs the teaching and learning of science, with attention to the how technology can be a driver of success that positively impacts effective instructional practices.

Become a Dynamo in your Community: Create an Ecosystem of STEM Learning. What are the critical elements for effectively building relationships with all stakeholders? How do we ensure that science learning has a place both in and out of school? Leaders from successful STEM ecosystems will share practices that are foundational to improving science learning in the community—all with the leader at the center.

In addition, events throughout the Institute give us the opportunity to connect and collaborate with colleagues from around the country. In addition to breakout and work sessions, these opportunities include: Technology panel discussion sponsored by Texas Instruments; Reception and Tech demos sponsored by Vernier; and Reception and Omaha Zoo Immersion sponsored by Discovery Education.

Special thanks to our sponsors, professional development committee, local leaders, and especially Omaha’s Henry Doorly Zoo & Aquarium making this Summer Leadership Institute possible.

Let’s learn, collaborate and grow together. NSELA is committed to supporting science leaders like you, and the connections we establish during this Leadership Institute will continue to help us as we learn and lead in the years ahead.

Bob Sotak, Ed.D.
NSELA President, 2017-2018
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If your actions inspire others to dream more, learn more, do more and become more, you are a leader.

John Quincy Adams

A very special thank you to our leaders.
Leaders in Science Education,

As we shared in Los Angeles earlier this year, at no time in our country's history has science education been more important than it is today. Whether it be addressing mankind's grand challenges facing coming generations, or finding solutions to local issues tomorrow, science education leaders must navigate a shifting landscape all while owning the responsibility of implementing positive changes in their field. As science education leaders, we are tasked with understanding the current trends in science education; making decisions on current trends based on evidence; and implementing instructional practices to reflect changes in science education. The leadership strands for the 2017 Summer Leadership Institute are designed to equip science leaders with the tools and resources to tackle the grand challenges in leading effective science education in an ever-changing system.

The 2017 NSELA Summer Leadership Institute, “Dimensions and Dynamos: Leading for Success in a Transitional Era of New Standards and Technology”, will be held in Omaha, Nebraska, from Wednesday, June 28 through Saturday, July 1, 2017. The focus of our work will braid together three important facets of the work for science leadership:

1. Cultivating Three Dimensional Learning In States, Districts and Schools (with NSTA)
2. Leadership in Aligning Technology with Standards-based Learning
3. Become a Dynamo in your Community: Create an Ecosystem of STEM Learning

**Cultivating Three Dimensional Learning in States, Districts and Schools (with NSTA)**
The intent of this strand is to engage science leaders in thoughtful reflection of their own science curricula, programs and/or classrooms, and how three-dimensional instructional principles and practices create a learning space where students connect with the real world. Unpacking the Framework? We have you covered. Modeling in classrooms? It's all here. Led by experts from the National Science Teachers Association, Ted Willard and Susan Koba, this strand will advance all science leaders understanding of three dimensional learning and why it should have a place in every science educator’s classroom.

**Leadership in Aligning Technology with Standards-based Learning**
The intent of this strand is to engage science leaders in understanding essential principles of cutting-edge research that informs the teaching and learning of science, with particular attention to the how technology can be a driver of success that positively impacts effective instructional practices.

**Become a Dynamo in your Community: Create an Ecosystem of STEM Learning**
The intent of this strand is to engage science leaders in the critical elements for effectively building relationships with all stakeholders, ensuring that science learning has a place both in and out of school. Leaders from successful STEM ecosystems will share practices that are foundational to improving science learning in the community—all with the leader at the center.

We thank the **Omaha Henry Doorly Zoo and Aquarium** for their support of the 2017 NSELA Summer Leadership Institute. All participants are entitled to a 30% discount at concessions and the gift shop for the event period (Tuesday through Sunday). Participants may also enjoy complimentary IMAX and special event ride tickets at the zoo. Simply show your badge to receive these great benefits!
National Science Education Leadership Association
2017 Summer Leadership Institute

Dimensions and Dynamos: Leading for Success in a Transitional Era of New Standards and Technology

Program at a Glance

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<td>8:45am: General Session II – Leadership Panel On Technology (Sponsored by Texas Instruments)</td>
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<td>10:30am: Break and Networking</td>
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2017 Summer Leadership Institute
Transportation Schedule

**Wednesday, June 28**
Hilton Omaha, Pick-up Times:
9:00am, 9:30am, and 11:00am - 12:30pm (continuous shuttle during this period)

Return Times from the Omaha Henry Doorly Zoo and Aquarium (depart destination):
5:30pm, 6:00pm
(Reception at the Hilton Omaha begins at 6:30pm)

**Thursday, June 29**
Hilton Omaha, Pick-up Times:
7:15am - 8:30am (continuous shuttle during this period)
(Breakfast served at the Omaha Henry Doorly Zoo and Aquarium from 7:45am - 8:15am)

Return Times from the Omaha Henry Doorly Zoo and Aquarium (depart destination):
After Conference
5:30pm - 6:45pm (continuous shuttle during this period)
After Reception
9:45pm - 10:45pm (continuous shuttle during this period)

**Friday, June 30**
Hilton Omaha, Pick-up Times:
7:45am - 8:45am (continuous shuttle during this period)
(Breakfast served at the Omaha Henry Doorly Zoo and Aquarium from 8:15am - 8:45am)

Return Times from the Omaha Henry Doorly Zoo and Aquarium (depart destination):
3:00pm - 4:00pm (continuous shuttle during this period)

**Onsite Contacts**
Stacie Cisco, Civica, 303.929.4500; Larry Plank, NSELA, 813.857.7368
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2017 Summer Leadership Institute
Wednesday, June 28, 2017

8:00am-11:30am: Optional Field Experience (Additional Registration Required; www.NSELA.org/sli/521-2017-sli-events)
Please meet Zoo Education Staff at Hilton Hotel Lobby at 7:45am.

- **Tour Option 1 (capacity: 22, Fee/pp: $20)** Aquarium/Center for Conservation and Research
  - What does it take to operate a larger-than-life aquarium? Get a behind the scenes look at the life support systems, husbandry, and conservation projects located in the largest aquarium within a zoo setting. Next, visit the Center for Conservation and Research (CCR) at Omaha’s Henry Doorly Zoo and Aquarium. This Center has built a vigorous program of scientific investigation in the fields of molecular genetics, reproductive physiology, nutrition, plant micro propagation and conservation medicine. The work done at Omaha’s Zoo and Aquarium is intended to have a global impact through numerous in-situ and ex-situ projects and collaborations in conservation programs.

- **Tour Option 2 (capacity: 22, Fee/pp: $20)** Amphibian Conservation Area/Giraffe Husbandry
  - Get an in-depth look at the Amphibian Conservation Area at Omaha’s Henry Doorly Zoo and Aquarium, a non-public research area, designed as a quarantine area to house and breed amphibians threatened with extinction. Individual, bio-secure isolation rooms, capable of holding up to 3,000 individuals and 50 different species, prevent the spread of disease between species. Then, head over to our state-of-the-art Giraffe Herd Room built in 2016 and meet with keepers to learn about giraffe husbandry and conservation.

7:00am: Conference Registration and Presenter Onboarding
Please visit our registration desks at the Hilton Omaha (7:00am to 11:00am) or Omaha Henry Doorly Zoo and Aquarium (beginning at 11:30am) located in the Suzanne and Walter Scott Aquarium Education and Conference Center.

1:00pm: Welcome and Overview of the 2017 NSELA Summer Leadership Institute
Grand Reef Ballroom
**Bob Sotak, President, National Science Education Leadership Association**
**Elizabeth Mulkerrin, Director for Education, Omaha Henry Doorly Zoo and Aquarium**
**Larry Plank, Interim Executive Director, National Science Education Leadership Association**

1:30pm: General Session I - Introduction to 3-Dimensional Learning (with an Immersion Experience)
Grand Reef Ballroom
**Susan Koba and Ted Willard, National Science Teachers Association**
Participants explore how new science standards use performance expectations to assess student achievement of science and engineering practices, disciplinary core ideas, and crosscutting concepts. They then assume the role of students investigating the structure and properties of matter, and then observe video of a classroom where students conduct evidence-based arguments about their models of matter. Participants identify evidence of the dimensions as they explore 3-dimensional learning.

3:30pm: Break and Networking
Enjoy a quick peek at the incredible wildlife around you and recharge with a snack!
3:45pm: Concurrent Sessions I (Please see back of program for map of each room location)

Session A: Unpacking the Practices of Modeling (Grand Reef Ballroom)
Ted Willard, National Science Teachers Association
Participants analyze and clarify the key practice of developing and using models by applying a process for studying standards.

Session B: Unpacking the Practices of Explanations (Queen Angel Room)
Susan Koba, National Science Teachers Association
Participants analyze and clarify the key practice of constructing explanations by applying a process for studying standards.

Session C: A District’s Approach to Expanding Engineering Education in K-8 Schools (Clown Trigger Room)
Larry Plank and Joseph Simmons, Hillsborough County Public Schools
Participants in this session will learn about how the 8th largest school district in the country developed an aggressive plan to incorporate engineering and design challenges into the regular school day for 200 school sites. A “playbook” for STEM education and scaffolding PD for educators will be shared as a result of the district’s participation in the first 100Kin10 Fellowship to Expand and Enhance Engineering Education in K-8 Schools. The foundational work of the Tampa Bay STEM Network will also be shared.

Session D: Technology supporting STEM in the Classroom (Durham Lodge)
Ellen Browne, T³ National Instructor (Teachers Teaching with Technology)
Explore new, engaging technology and activities designed to support STEM in the classroom. Science and engineering practices come alive through student discovery and investigations. TI-Innovator™ Hub with TI LaunchPad™ Board along with TI-Nspire™ CX technology provide easy-to-use and easily available technology with limitless possibilities for your students. Learn some coding basics including how to light an LED and “write” a song.

5:00pm: Break and Networking
Enjoy a quick peek at the incredible wildlife around you!

5:15pm: Closing and Daily Surveys
Please take a few moments to complete our online survey to assure we provide excellence for you on Thursday!
https://www.surveymonkey.com/r/NSELASLIDay1

6:30pm: Reception and Tech Demos (Sponsored by Vernier) (Saint Nick B Room, Hilton Omaha)
Join Vernier and NSELA at the Hilton Omaha to enjoy heavy hors d’oeuvres and beverages in a fun and exciting technology-immersed environment! We will transform the Omaha Hilton and gather your wonderings about technology in the classroom!
Hilton Omaha, 1001 Cass St, Omaha, NE 68102.

8:00pm: Dinner On Your Own – Visit Omaha’s Old Market District
Enjoy fantastic restaurants and watering holes in the historic Old Market district of Downtown Omaha! More information can be found at the following website: www.oldmarket.com.
Congratulations to the Vernier Emerging Science Education Leader Scholarship Winners

Sarah Adumat
Oshkosh Area School District • WI

Heather Moll
Scottsdale Unified School District • AZ

Alfonso Garcia
Portland Public Schools • OR

Anissa Angier
Edmond Public Schools • OK

Joe Simmons
Hillsborough County Public Schools • FL

Amy K. Murphy, Ph.D.
University of Montevallo • AL

To apply for the 2018 Vernier ESELS, visit nsela.net/awards/esels
2017 Summer Leadership Institute
Thursday, June 29, 2017

Shuttle service from the Hilton Omaha to the Omaha Henry Doorly Zoo and Aquarium will begin at 7:15am with continuous service. Alternative options include hotel shuttles and taxis.

7:45am: Breakfast, Omaha's Henry Doorly Zoo and Aquarium
Grand Reef Ballroom
Please join us for a jungle-themed breakfast and networking session in which you will work with your table mates to engineer a habitat solution with your table-mates!

8:30am: Welcome and Overview, Omaha's Henry Doorly Zoo and Aquarium
Grand Reef Ballroom
Larry Plank, Interim Executive Director of NSELA, will welcome everyone to day two of the NSELA Summer Leadership Institute and provide an overview for the day’s experiences.

8:45am: General Session II - Panel Discussion: The Leader’s Role in Advancing Science & STEM Learning Using Technology
Grand Reef Ballroom
(Sponsored by Texas Instruments)
Larry Plank, Interim Executive Director, NSELA, Moderator
Panelists: Peter McLaren, Director and Founder, Next Gen Education; Ellen Browne, Texas Instruments National Instructor and Educator, Pomfret School, Pomfret, CT; Dr. James Blake, K-12 Science Curriculum Specialist, Lincoln Public Schools
As states implement science standards based upon The Framework for Science Education and NGSS, the use of technology is increasingly prevalent in the process. Students and their teachers need to become familiar with authentic use of technology to explain phenomena and design solutions to problems. In this panel discussion challenges, and opportunities presented by educational technology will be discussed with a focus to how technology will support implementation of three-dimensional science standards.

10:30am: Break and Networking
Enjoy a quick peek at the incredible wildlife around you and recharge with a snack!

10:45am: General Session III - STEM Ready America: Anatomy of A National Movement to Infuse STEM into Afterschool and Summer Learning
Grand Reef Ballroom
Cary Sneider, STEM Next
For the past decade, a small number of private foundations, in close collaboration with local, state and national leaders, have been building an infrastructure to support high quality STEM programs in the wide diversity of afterschool and summer programs for millions of children and youth. The underpinnings of this movement—including new organizational systems and research studies—have recently been documented in a collection of articles, under the title STEM Ready America: Inspiring and Preparing Students for Success with Afterschool and Summer Learning (www.stemreadyamerica.org). This presentation will provide an overview of the key ideas and research findings, including a study of the impacts of STEM in afterschool, involving 1,599 children and youth in grades 4-12 enrolled in 160 afterschool programs in eleven states.

11:30am: Break and Networking
Enjoy a quick peek at the incredible wildlife around you and recharge with a snack!
11:45am: Lunch and Keynote - Inspiring Students through "Glocal" Impacts  
Jonathan Gerlach, Discovery Education  
Grand Reef Ballroom  
Many educators cringe at the question, "why do I need to know this?" STEM isn’t just about preparing students for their futures, it’s also about providing students with the tools to begin solving the global challenges we all face. In demonstrating how the skills, content, and ideas they investigate in class relate to their own world, and showing students how to impact the larger world by solving local challenges, educators give new purpose to teaching and learning.

12:45pm: General Session IV – Three Dimensional Learning: Using Phenomena and Developing Storylines  
Grand Reef Ballroom  
Susan Koba and Ted Willard, National Science Teachers Association  
Participants explore how they can use phenomena to motivate students to engage in science and engineering practices and develop deeper understanding of disciplinary core ideas and crosscutting concepts.

2:30pm: Break and Networking  
Enjoy a quick peek at the incredible wildlife around you and recharge with a snack!

2:45pm: Concurrent Sessions II

Session A: Unpacking Disciplinary Core Ideas for Life Science  
(Queen Angel Room)  
Susan Koba, National Science Teachers Association  
Participants engage in a process of analyzing and clarifying core ideas (unpacking) as an essential step in planning lessons and units.

Session B: Unpacking Disciplinary Core Ideas for Physical Science  
(Grand Reef Ballroom)  
Ted Willard, National Science Teachers Association  
Participants engage in a process of analyzing and clarifying core ideas (unpacking) as an essential step in planning lessons and units.

Session C: Learning Experiences Designed with a STEM Cultures  
(Clown Trigger Room)  
Jonathan Gerlach, Discovery Education  
What does STEM instruction look like? This question is being debated throughout education and there may never be a single answer. Together, we will explore how classroom cultural approaches, instructional strategies, and STEM dispositions/skills can be engaged across content and grade levels to STEM-fuse teaching and learning. Join us to learn how to create a culture of STEM through a hands-on/minds-on experience and take ideas away to implement STEM immediately into any classroom.

Session D: STEM Ready America: Expanding STEM Learning Opportunities Through Partnerships  
(Durham Lodge)  
Cary Schneider, STEM Next, and Julie Sigmon, Director, Omaha STEM Learning Ecosystem  
Today, tens of millions of children and youth are receiving high quality STEM learning experiences after school and during the summer. The key to increasing these highly motivating learning opportunities has been to form partnerships—including collaborations among foundations with similar goals, between funders and large youth-serving organizations, and between schools and a wide range of community partners. This breakout session will engage participants in discussions about three partnership initiatives: 1) Imagine Science, a collaboration among four large youth-serving organizations; 2) State Afterschool Networks, which is a joint project between STEM Next and the Mott Foundation; and 3) STEM Ecosystems, which brings together a community’s STEM resources to take optimal advantage of afterschool and summer learning time.

4:15pm: Break and Networking  
Enjoy a quick peek at the incredible wildlife around you and recharge with a snack!
4:30pm: Unconference I: Share a Tech Tool!
**Grand Reef Ballroom (Please Refer to Sign Up Sheet)**
Learn from leaders around the nation who will share their favorite tech tool! From software to applications to hardware to other gadgets, join a table and learn about a tool to take back into your profession work! Tools will be identified throughout the day – be on the lookout for directions at lunchtime!

5:15pm: Closing and Daily Surveys
Please take a few moments to complete our online survey to assure we provide excellence for you on Friday!
https://www.surveymonkey.com/r/NSELASLIDay2

6:30pm: Reception and Omaha Henry Doorly Zoo and Aquarium Immersion Experience, African Lodge (Sponsored by Discovery Education)
Join us for a wild time at the zoo with Discovery Education and the Henry Doorly Zoo and Aquarium education team! Heavy hors d’oeuvres and beverages will be provided for all attendees! Also, be sure to sign up for the final day zoo safari - ask for details! We ask that all guests kindly depart the zoo no later than 10:30pm.
2017 Summer Leadership Institute  
Friday, June 30, 2017

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8:15am: Breakfast, Omaha’s Henry Doorly Zoo and Aquarium  
Grand Reef Ballroom  
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9:00am: Welcome and Overview, Omaha’s Henry Doorly Zoo and Aquarium  
Grand Reef Ballroom  
Larry Plank, Interim Executive Director of NSELA will welcome everyone to day three of the NSELA Summer Leadership Institute and provide an overview for the day’s experiences.

9:15am: General Session V – Three-Dimensional Lesson Objectives and Lesson Level Learning Performances  
Grand Reef Ballroom  
Ted Willard, National Science Teachers Association  
Participants develop three-dimensional descriptions of what students are doing in a lesson as well as three-dimensional descriptions of how students show what they have learned.

10:30am: Break and Networking  
Enjoy a quick peek at the incredible wildlife around you and recharge with a snack!

10:45am: Concurrent Sessions III

**Session A: Planning for Professional Learning that Supports Three-Dimensional Standards Implementation**  
(Queen Angel Room)  
Susan Koba, National Science Teachers Association  
Participants learn about professional learning needs assessment, explore the analysis of recent research, and begin first steps toward a professional development plan.

**Session B: NSTA Resources to Support Three Dimensional Teaching and Learning**  
(Grand Reef Ballroom)  
Ted Willard, National Science Teachers Association  
Participants learn about resources available in the NGSS@NSTA Hub and the NSTA Learning Center to support educators’ implementation of three-dimensional standards.

**Session C: Reflecting on a Culture of STEM**  
(Clown Trigger Room)  
Jonathan Gerlach, Discovery Education  
STEM is a culture of teaching and learning that, when effective, permeates throughout a classroom, school, and community. Unlike an instructional strategy or a set of student scores, culture is not as simple to define or measure. During this session, participants will re-examine and reflect upon cultural indicators for STEM success in their schools, districts, and community. Understanding trends in instruction and culture helps build towards the future.
Session D: Using Technology to Support Instructional Coaching for Standards-based Learning (Durham Lodge)

Dr. Gwen Nugent, Dr. James Houston, Dr. Gina Kunz; Nebraska Center for Research on Children, Youth, Families and Schools; University of Nebraska-Lincoln

This session will share latest research on instructional coaching, drawing on results from two University of Nebraska science coaching projects funded by the U.S. Department of Education and the National Science Foundation. Discussion will focus on research showing the effectiveness of coaching, as well as studies exploring how coaching works. Participants will have the opportunity to provide input on a national coaching study – sharing perspectives on key coaching strategies and related variables that maximize positive teacher and student outcomes.

12:00pm: Break and Networking
Enjoy a quick peek at the incredible wildlife around you.

12:15pm: Lunch and Keynote
Grand Reef Ballroom
Sit back, relax and enjoy a meal and keynote brought to you from STEM Next’s Cary Sneider.

From Science to STEM: A Work in Progress. Since its release in 2013, the Next Generation Science Standards (NGSS) has been adopted by 18 states, and many more have developed science education standards that incorporate its key innovations. The purpose of these standards is to guide the work of the entire educational community, from K-12 teachers and educators at museums and science centers, to leaders of afterschool and summer programs. One of the major shifts called for by the NGSS is the inclusion of engineering and technology, alongside science and its longtime partner, mathematics.

1:30pm General Session VI - Tying It All Together!
Big Back Yard (Weather Permitting Outside)
An NSELA tradition was began in 2016 in San Diego with ball of twine and we look forward to sharing again in 2017 at the Omaha Henry Doorly Zoo and Aquarium! Be a part of our closing video and share out your thoughts on the 2017 NSELA Summer Leadership Institute in a fun game!

2:30pm: General Session VII - Closing, Next Steps and Daily Surveys
Grand Reef Ballroom
Please take a few moments to complete our online survey to assure we provide excellence for you on at our next meeting!
https://www.surveymonkey.com/r/NSELASLIDay3

3:00pm: Team Planning Time
Grand Reef Ballroom
Take a moment to share with colleagues your plans to transform your learning into practice in your school, district, college, university or state.

4:00pm: Formal Conference Adjourns

Saturday, July 1, 2017

Breakfast on Your Own

7:45am-12:00pm: Optional Field Experience: Lee G. Simmons Wildlife Safari Park & Strategic Air Command and Aerospace Museum
Please meet Zoo Education Staff at Hilton Hotel Lobby at 7:45am
(capacity: 32, Fee/pp: $35, minimum tour participation required)
Go on a 4-mile drive thru adventure and see native North American animals such as elk, wolves, bison and black bear. Dive into wetlands and sample amphibian populations for disease. Then, visit the SAC Aerospace Museum which was built to preserve the history of Strategic Air Command, the Cold War and aerospace artifacts and is home to over 300,000 square feet of exhibits, including military aircraft.
Inspiring Generation STEM

There is a mathemaTiCian and scientTiSt in every student.

education.ti.com
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2013-2014 Darlene Ryan, North Carolina
2012-2013 Beth Allan, Oklahoma
2011-2012 Janey Kaufmann, Arizona
2010-2011 Susan Koba, Nebraska
2009-2010 Brenda Wojnowski, Texas
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1970-1971 Francis Finigan, Massachusetts
1967-1968 A.C. Brewer, Missouri
1966-1967 Annie Sue Brown, Georgia
1965-1966 J. Harvey Shutts, Minnesota
1964-1965 Donald Stotler, Oregon
1963-1964 Ralph Kierstead, New England
1962-1963 Elra Palmer, Maryland
1961-1962 Elmer McDaid, Michigan
1959-1960 Kenneth Vordenburg, Ohio (Ad Hoc Chair)

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