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19th Annual
Space Exploration Educators Conference

SPACE
CENTER
HOUSTON

February 7-9, 2013

Session descriptions

Friday

BEYOND ALL LIMITS



Friday 2/8/2013

7:15am	Check-in
8:00am-9:15am	Key Note - TBA
10:00am-11:30am	First Session
11:30am-12:30pm	Lunch
12:45pm-2:15pm	Second Session
2:45pm-4:15pm	Third Session
4:45pm	Dismiss (Bus Run Begins)
7:15pm-11:45pm	Banquet

Sessions will take place at Space Center Houston, JSC Gilruth and other JSC areas *8 hours CPE Credit

Session Selection

Selecting your individual breakout sessions is easy! Just read through this conference booklet to see the selections for each time slot. Then, use the “Organize Your Sessions” form on page 10 to organize your sessions. Finally, go online and make your session selections at www.spacecenter.org/TeachersSEEC.html. Sessions that are full will not appear. It’s that easy! **Just be sure to move quickly as some sessions fill up fast.** Breakout sessions include NASA tours as well as the hands-on sessions. Tours fill up especially fast, so please plan accordingly. **(All tours require closed-toe shoes)**

If a session is full, don’t worry. Check with the Conference Help Table when you arrive to see if there are openings or watch the “swap” board for the session ticket.

If you have any questions, please contact us by e-mail at SEEC@spacecenter.org.

Johnson Space Center Tours:

Aircraft Operations Tour

A plane that creates free-fall, high altitude research aircraft, T-38s, and other NASA aircraft... Johnson Space Center's Aircraft Operations has it all! Hear how aeronautics is a part of the future of space exploration.

Mission Control Tour

Once the manned spacecraft have launched, Houston Mission Control takes over. Visit this secure location and see the rooms where history happened. You will be able to see both Historic Mission Control and ISS Control rooms.

Neutral Buoyancy Lab

Take a trip to the largest pool in the world where astronauts practice for their spacewalks—the NBL. This facility is the underwater training facility for the astronauts and your chance to see state-of-the-art training—the next best thing to space!

Space Vehicle Mock-up Facility (SVMF)

Explore the training grounds for the astronauts. See full size mock-ups of the Space Station and Orion. It also includes several other small part task trainers and mockups.

Energy Systems Test Laboratory (Pyrotechnics)

Visit the area that supports testing of pyrotechnically actuated devices. The facility includes explosive loading and handling room, and pyrotechnic storage in earth covered bunkers. Sophisticated equipment, such as the laser interferometer for measuring speeds of up to 10,000 m/s is available in the B352 complement of instrumentation.

Precision Air Bearing Floor (PABF)

The Precision Air Bearing Floor (PABF) is used for extravehicular activity (EVA) training, Intravehicular activity (IVA) training, and mass handling training. It is primarily a human factors training facility for microgravity operations. A major use is to train the astronauts in the importance of moving/doing things slowly in microgravity. It can demonstrate the validity of the three Newton's Laws of motion in microgravity.

Habitat Demonstration Unit & Morpheus

Tour NASA's conceptual, human-centered design studio. The HDC creates opportunities for design to solve the unique challenges of living and working in extreme environments, providing advanced concepts to the NASA community using Human Factors as a design tool to develop products, systems, and architecture.

IMPORTANT NOTICE!!! PLEASE READ CAREFULLY

- Your visit to the Johnson Space Center (JSC) is a special event. You will be entering working facilities subject to strict safety and security policies. Please follow the direction of your host escort at all times.
- It is essential that all members of the group stay together and not venture from their JSC escort. Wandering into restricted areas constitutes a security violation and could result in the termination of your visit.
- Your visit will require walking and standing for extended periods and may involve climbing several flights of stairs. Guests should wear comfortable, flat, fully-enclosed shoes (no high-heels, sandals, flip-flops, slides, mules, Crocs, etc.) during their visit. We also recommend that guests wear slacks (instead of shorts or skirts) as an additional safety precaution.
- Cameras are welcome in all facilities unless instructed otherwise. However, photography of individuals is discouraged without permission.

ATTENTION ALL NON-U.S. CITIZENS

If you are not a U.S. citizen, you must fill out a JSC Security Form in order to attend the NASA Tours. Please go to the SEEC website for more information and to download the form. <http://www.spacecenter.org/TeachersSEEC.html>

10:00 AM– 11:30 AM

A Woman's Place is in Outer Space

Adrienne Provenzano, Independent Teaching Artist

Be inspired by the photographic history of women in space exploration. Imagine yourself on a low-Earth orbit spacewalk or as part of a ground team developing robotic rovers! Engage your powers of observation and communication skills in this dynamic, multi-disciplinary workshop where a picture is worth a student's words!

Grades: K-12

Subjects: Science, Technology, Math, Social Studies, History, Language Arts

Blast Off!

Lanena Berry, Johnston Middle School

Learn how to use rockets in your classroom to stimulate students! All participants will be given schematics for constructing launch apparatus as well as helpful hints for constructing and blasting off three different types of rockets: paper, water, and model. Various rocket designs will be tested and winners will receive prizes!

Grades: 3-12 Subjects: Science

Far Out Space Places

Dan Malerbo, Carnegie Science Center

Find out how to excite and involve your youngest students in manned and robotic space exploration. Discover the right hands-on activities that will introduce them to the far out places in our solar system and concepts of gravity and microgravity. Discover how to introduce your young learners to rockets, robotic spacecraft, and the International Space Station. Hand-outs and door prizes provided!

Grades: K-2

Subjects: Science, Technology, Language Arts, Math, Physical Education and Health, History

Fish Astronauts on the International Space Station

Kat Mills, Network of Educator Astronaut Teachers

Christy Garvin, Vaughan Elementary & NASA EDPN

"How does a FISH become an astronaut? Why do you need to send fish into space? Replicate two simple and exciting microgravity experiments in your own classroom. Construct the apparatus needed, run the experiment and see results from shuttle and ISS missions. Free lesson plans, projects and digital resources.

Grades: 5-12

Subjects: Science, Technology, Language Arts, Math, Social Studies, History

Food in Space: NASA Food Lab

Vicky Kolaris, NASA jsc

Yummy...Astronaut Food! Have you ever wondered how space food is prepared and packaged? Visit with food lab experts from Johnson Space Center's food lab. Learn how nutritionists, dieticians, and engineers prepare food for flight.
Grades: K-12

It's A Matter of Taste!

Laura Teatsworth, Houston ISD

Nikki Skinner, Houston ISD

We will have stations in our room where teachers receive hands-on lab ideas, activities that envelope Language, Reading, Math and Science Learning. We will make Ice Cream, Tang, Butter, "Space" men and Astronaut Pudding, and have a blast sharing our recipes and experiences!

Grades: K-2 Subject: Science

Living and Working Together on the ISS!

Brian Ewenson, Brianewenson.com

Brian Jackson, Ralph McCall School

The ISS is an engineering marvel; we will cover the opportunities and challenges of people from 16 countries working together in space with different languages and cultures. We will highlight Expedition 34/35, in space right now, with Canadian Commander Chris Hadfield on board.
Grades: 3-12

Subjects: Science, Math, Technology, Physical Education, Language Arts, Fine Arts, Social Studies, History

Martians, Earthlings and Eggstronauts

Tom Holcomb, Kansas Cosmosphere and Space Center

Delve deep into Martian history. Engineer a Martian Lander that protects your eggstronaut from a long fall, while you stay on a tight budget. Land closest to the target, for the lowest price, without breaking the fragile cargo to win. Sound simple? Try it!

Grades: 3-5

Subjects: Science, Technology, Math, Social Studies

Microgravity and Underwater Robotics

Kim Taliaferro, NASA/JSC Aerospace Academy (AA)

Javier Montiel, Volunteer-Aerospace Academy

From the oceans to space, dabble in this journey to study microgravity through underwater robotics. You will have a hands-on experience to learn the basics in electronics and soldering techniques to build your own circuit board. Explore our educator training opportunities in underwater robotics at San Jacinto College Aerospace Academy.
Grades: 6-8 Subjects: Science, Technology

NASA's Educator Resource Center and You!

Elaine Lapka, NASA Educator Resource Center

ERC staff is your guide to NASA educational programs and standards-aligned K-18 teaching resources online, on paper, and on disc. Bring your laptop to this session to explore free online lessons, activities, simulations, and inter-actives for all disciplines, emphasizing STEM.

Grades: K-12 Subjects: Cross Curriculum

STEM on Station with NASA's Digital Learning Network

Patricia Moore, NASA JSC Digital Learning Network

Michael Hare NASA JSC Digital Learning Network

Julie Mules, NASA JSC Digital Learning Network

Don Caminati, NASA JSC Digital Learning Network

NASA's Digital Learning Network (DLN) connects your students to NASA engineers, scientists and education specialists. Session participants will travel onsite to the Johnson Space Center DLN studios to experience the new STEM on Station module. Participants will become International Space Station scientists and engineers as they tackle real world scenarios and present their results on camera in the DLN studio. All attendees will receive a video recording of their on-camera experience and ready to implement lesson plans.

Grades: 6-8

Subjects: Science, Technology, Language Arts, Math

Real-time Radio Observations in Astronomy

Christi Whitworth, Pisgah Astronomical Research Institute

Michael Castelaz, Pisgah Astronomical Research Institute

Learn the basics of radio astronomy. Via the Internet, train to remotely operate a 4.6-meter radio telescope and accompanying labs with your middle and high school students to investigate the Radio Sky.

Grades: 6-12 Subjects: Science, Technology, History

Satellites from Start to Finish the Fun Way

Jeff Kaloostian, School District of Hillsborough County FL

This session will discuss Space Engineering Systems and the roles of satellites for global awareness and communications. It will demonstrate how to incorporate discussing satellite mission definition using NASA's online directory, building a "junk" satellite from readily available household items and describing its orbit's Classical Orbital Elements using the STK space animation software. Overall, it guides a student from satellite research to COE definition and on to satellite building. A great way to incorporate several concepts using today's most active space missions!

Grades: 9-12

Subject: Science, Technology, Math, History

Space Launch System (SLS): Launching Beyond Earth's Orbit

*Twila Schneider, NASA Marshall Space Flight Center
Shannon Raleigh, NASA Marshall Space Flight Center*

A Space Launch System (SLS) overview briefing geared toward K-8 students will be presented. A hands-on rocket activity, 3...2...1...PUFF! will be conducted. The overview briefing, hands-on activity plan and many more resources will be provided to all participants on a CD/DVD.

Grades: K-8 Subjects: Science, Math

Up, Up and Away!

Lynne Hehr, Arkansas NASA ERC/CMASE

John Hehr, University of Arkansas, Geoscience

With the creation and liftoff of the hot air balloon, humanity was launched into space exploration that now continues with future Mars missions. Attend this session to 1) make 8+’ hot air balloons, 2) explore the history of the Space Race and 3) receive materials/PPT presentation suitable for classroom implementation.

Grades: 3-12 Subjects: Science

Tours:

Space Vehicle Mock-Up Facility (SVMF)

Energy Systems Test Laboratory (Pyrotechnics)

Habitat Demonstration Unit & Morpheus

Precision Air Bearing Floor (PABF)

Tour descriptions listed on page 3

12:45PM-2:15PM

Ants In Space - Real Space Science in Your Classroom!

Gregory Vogt, Baylor College of Medicine, Center for Educational Outreach

Dee Mock, Baylor College of Medicine, Center for Educational Outreach

Ants return to space! Learn about the next student-centered life science microgravity-based investigation - Ants in Space! Join thousands of teachers and students around the world as they set up their own ground-based colonies, ask their own research questions, collect data from their colony and formulate their own conclusion.

Grades: K-12

Subjects: Science, Technology, Language Arts, Math, History

A Hands-on Approach to Combine History and Science

Gregory P. Kennedy, NASTAR Center

This session illustrates a multidisciplinary method that blends history with hands-on activities to engage students. This provides a vehicle for students to learn scientific principles and serves as a platform for classroom discussion on the impact of technology on society. Thus, it combines science and social studies in a fun, engaging way.

Grades: 3-8

Subject: Science, Technology, Social Studies, History

Come Fly with Civil Air Patrol! (Double Session)

Susan Mallett, Civil Air Patrol

Debbie Dahl, Civil Air Patrol

Fly over Houston in Civil Air Patrol airplanes, weather permitting. Take aerial photos, learn about flight, get airfield tour, and receive free K-12 STEM materials! Must be a CAP teacher member to fly. Join at www.capmembers.com/joinaem. Use Coupon Code SEEC for 1/2 price (\$17.50). Lots of free membership benefits! Can also fly free back at your local airport! **NOTE: This is a double session!**

Grades: K-12 Subjects: Science, Technology, Math

FAB Science Bags

Betty Bigney, Dixon Elementary School

Holly Mentillo, Ocean Breeze Elementary School

You will learn about Newton's Laws of Motion and experience inexpensive, hands-on activities that will teach students about force and motion. All materials, directions, and a CD with podcasts about Newton's Laws will be collected in a

"FAB Science Bag"!

Grades: 3-5 Subjects: Science, Technology

Earth & Space Scientist in the K-2 Classroom

Jennifer Becerra, Northside ISD Briscoe Middle School

Jennifer St. Pierre, Northside ISD

Explore Earth & Space science using iPods and iPads in the K-2 classroom. We will have fun with concepts such as Force and motion, moon phases, day and night, objects in the sky and in the solar system. Receive exciting classroom lessons and door prizes!

Grades: K-2 Subjects: Science

ISS CONSTRUCTION SIMULATION (Dive Session) (Double Session)

Craig Shannon, NBL Dive Master

Train like astronauts in this exciting session! You will participate in underwater training exercises using SCUBA gear in a local indoor pool. No previous experience necessary. *Bring a swimsuit and towel. (T-shirts not required but helpful)*

Additional \$35 charge for this session. NOTE: This is a double session!

(If registering for this session pay online first) This session is not available to select online. We will add you to it once you have paid online. Leave the time slot open on your session selection)

Grades k-12

NASA MEDIA (NASA Media Enhances & Develops Instructional Activities)

Amanda Ewenson, Hoffmann Elementary/Northside ISD

It's time to bring worthwhile media into the classroom! NASA's website provides a wealth of media that can enhance and develop lessons to be more engaging for students. Through the use of various media, lessons can be brought to life in new ways. Teachers will receive resources and lesson plans.

Grades: 3-8

Subjects: Science, Technology, Math, Social Studies, History, Language Arts

Return to the Moon in your Classroom!

Suzanne Foxworth, Solar System Educator/TSGC

Michael Myers, LiftOff TSGC

Learn about the Moon and your student's role in the future of space exploration. Packed full of hands on activities, handouts, curriculum on CD and door prizes. You will be active and participating in a variety of Moon exploration activities.

Grades: 3-8 Subjects: Science

Slide to Learn: iPad apps for Science

Jennifer Crow, Fort Bend ISD

iPads are becoming more common in the classroom but the abundance of apps can be overwhelming! BYOD as we will be exploring some free and low cost apps that can be used in the science curriculum as well as in other content areas.

Some lesson plans will be provided.

Grades: K-5 Subjects: Science, Technology

Spies, Spaceships, Monks, and M&Ms (Exponential Growth and Decay 101)

Ann Carbone, NASA Solar System Educator

What do all of these have to do with exponential growth and decay? We will find out by exploring the classic Tower of Hanoi legend, completing an exponential decay activity involving graphing and M&M candies, and viewing a NASA eClip that may surprise you.

Grades: 6-8 Subjects: Science, Math

Take Me to the Moon!

Alissa Keil, Oklahoma State University/TAMU

Teresa Sindelar, Oklahoma State University

So you want to travel to the Moon? You'll need a rocket and a lander and a teamwork approach. You will create an air-powered rocket to hit a distant target and a shock absorbing system to protect your astronauts as they land. Following the engineering design process, your team will design, build, test, and redesign in this out-of-this-world challenge.

Grades: 3-8 Subjects: Science

Teaching STEM on Station

Becky Kamas, NASA Johnson Space Center

Trinesha Dixon, NASA Johnson Space Center

Join NASA's Teaching From Space office as we show you how to bring the International Space Station into your classroom. Participate in hands-on STEM activities and learn about NASA's new website, Teach Station, and its main feature, STEM on Station, which contains videos of astronauts investigating STEM concepts aboard the station.

Grades: 6-12 Subject: Science, Math, Technology

The Moon Landing was a Fake & other PBL Astronomy Ideas

Spencer Martin, Manor New Tech High School

Did you know that the Moon landing was faked? This presentation will show how controversial issues have been used to engage students and anchor learning in a project-based classroom. PBL experience or structure are NOT

required or even recommended for this session.

Grades: 6-12 Subjects: Science

NASA: Train Like An Astronaut

Nubia A. Carvajal, NASA Human Research Education and Outreach

Timothy L. Vigorito, Sharon Public Schools

Want to inspire your students to be an astronaut? Want to have fun while learning? Join us at Train Like an Astronaut (TLA)! In this session you will participate and learn exercises that are used to train astronauts before, during, and after a mission, while learning the science behind staying fit!

Grades: 3-8

Subjects: Science, Physical Education and Health

Viewing Earth from Space

Joyce Hill, Highland Middle School

Susana Ramirez, Pharr San Juan Alamo ISD

There is nothing more spectacular than seeing images of our planet Earth from space. The current fleet of earth observing satellites gives us unprecedented ways to study Earth's land, air, oceans, ice and life using the latest space technology. Participants will conduct hands-on experiments on topography, remote sensing, and plate tectonics. Participants receive DVD and lessons. Door prizes and giveaways!

Grades: 6-8 Subjects: Science

Tours:

Aircraft Operations Tour

Mission Control Tour

Neutral Buoyancy Lab Tour

Tour descriptions listed on page 3

2:45 PM –4:15 PM

Advanced Imagine Rockets

Chris Welborn, CSCTOYSLLC

Nora Rankin, CSCTOYSLLC

Come play with our rockets! Experiments using simple rockets will be used to demonstrate team cooperation, basic statistical math skills including graphing, and experiment organization. Activities demonstrate action-reaction and the effects of gravity on objects in flight. Participants will receive materials for these and other activities to take home.

Grades: 6-8

Subjects: Science, Math, History

Astronishing Journey Through the Invisible Universe

Pamela Whiffen, NASA Educator Ambassador

Douglas J. Howard, Dunbar School

Amazing NASA imagery and classroom ready hands-on activities will take you on a fascinating, interactive journey through the invisible Universe. Explore the mysterious heliosphere, dark matter halos, black holes, and the search for gravity waves. Participants receive a NASA CD-ROM with an entire library of images, Power Points, and activities!

Grades: 6-12

Subjects: Science, Technology, Math

Bringing Space-Based Research into Your Classroom

Thomas Drummond, Orion's Quest

Angela Krause-Kuchta, Orion's Quest

Experience how your students can participate in actual space-based research being conducted by NASA scientists on the ISS. Using an internet based program students; learn about NASA scientists and their research, analyze down-linked still photos and video, collect and record data and evaluate results. Please bring your laptop or iPad.

Grades: 6-12

Subjects: Science, Technology, Math

Citizen Science and Citizen Space Exploration

Edward Wright, United States Rocket Academy

Maureen Adams, United States Rocket Academy

Citizens in Space will select 100 citizen-science experiments and 10 citizen astronauts to fly on the Lynx suborbital spacecraft. You could be one of the first. Former Space Shuttle commander and Lynx chief test pilot Colonel Rick Searfoss will join us to discuss this exciting program.

Grades: K-12

Subjects: Science, Technology

Global Satellite-Design Engineers Aim for the Moon!

Katrina L. Robinson, Katrina Lynn Educational Services

Don't miss this exciting, hands-on, STEM session! Design and build a satellite that will use cameras, heat sensors, and gravity probes to investigate the Moon's surface! Global Satellite-Design Engineers or "GSDE's" will use the Engineering Design Process to achieve this goal. Draw your design and create a working model.

Grades: 3-5 Subjects: Science, Math

Houston: We Are Go for Exploration

Heather Paul, NASA Crew and Thermal Systems Division

Strategic Communications Lead

Capturing the imagination of future explorers, this presentation and activity takes the audience on a journey through spaceflight history. The interactive event highlights past, current and future technologies that are important for crewed exploration missions, including space suits. Presenters will share details on the challenges of engineering, design, and testing. Participants will learn how to properly pack a space suit life support system with our activity, "Packing the PLSS." Participants will also learn how to request engineers from our fantastic team to present to their students and inspire the next generation of space explorers. Presentation with speaker notes will be available for session attendees.

Grades: 6-8 Subject: Science

Marble Powered Universe

Jackie Slaviero, Eastwood Public School, Australia

Be the first to complete a racing vehicle and get the checkered Flag! In the true spirit for global cooperation, teams will be formed and an engineering challenge will be given. In the time allocated, teams MUST compete for the ultimate prize and go for glory, without losing their marbles.

Grades: 3-5

Subjects: Science, Technology, Math

Modeling Objects in the Solar System

Margaret Baguio, Texas Space Grant Consortium

Rebecca Moreland, Highland Middle School

Participants will be given the opportunity to engage in multiple hands-on methods for modeling the solar system... from formation, to planet distances, along with the Earth/Moon system, and size and objects. In addition, participants will learn about equipment and transportation needed for space travel as well as power point presentations and lesson plans for all activities. Door prizes and giveaways!

Grades: 6-8 Subjects: Science

NASA Orion Program Overview

Stu McClung, NASA Johnson Space Center

Orion --NASA's next human spacecraft will provide the capability for humans to travel to deep space destinations. It will carry up to four astronauts on long-duration, deep space missions to destinations such as asteroids, the moon and eventually Mars. Learn about our upcoming flight test and preparation for manned missions.

Grades: K-12 Subject: Science

Reach for the Future: The ISI Connection!

Jean Trusedell, MSD of Decatur Township

Helen Harris, MSD of Decatur Township

This workshop explores the elements of the Indiana Science Initiative which uses journaling, communication and collaboration along with authentic applied Science. Participants will explore space robotics technology and how it is helping our Iraq war veterans. Handouts and lesson plans are provided along with walking through the unit.

Grades: K-8

Subjects: Science, Technology, Language Arts

Spaced out Social Media: Reach Beyond Your Classroom

Michael Wilkinson, Ethical Culture Fieldston School

You and your students have a lot to share! Learn about safe and appropriate uses of Social Media such as Twitter, Blogs, Edmodo, and Moodle. Bring your own device to explore NASA resources and set up your own class sites. Incorporate NASA Social Media resources and take your students on inspiring adventures!

Grades: K-12 Subjects: Cross Curriculum

Using Imagery from Space to Introduce Earth Systems

Paige Graff, Jacobs

Join this hands-on, inquiry-based session and work with stunning astronaut imagery to introduce and reinforce Earth systems in your classroom. Participants will share observations of imagery and gain experience creating questions that will help facilitate student investigation projects allowing teams to request new photographs from the ISS. NASA images/resources/handouts provided.

Grades: 3-12 Subjects: Science

What's Hidden Inside?

Beth White, NASA AESP

Why should robots travel places before people? Robots are tools for astronauts and scientists to safely gather information about the planets and moons. Understanding and using this information helps scientists prepare astronauts for their trip to space. In this activity, participants will gather information about items they cannot see, using limited senses. Participants will receive updates on current NASA robotics.

Grades: K-2 Subjects: Science, History

When You Wish Upon a Space Station

Dee Mock, Baylor College of Medicine Center for Educational Outreach

Christine Graham, McKinney ISD

Every child makes a wish upon a star, Let's encourage them to make a wish upon that bright moving "Star" that is actually the International Space Station! Join other PK-2 educators as we conduct developmentally appropriate space science investigations that will thrill and excite every child!

Grades: K-2 Subject: Science, Math

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Habitat Demonstration Unit & Morpheus

Precision Air Bearing Floor (PABF)

Space Vehicle Mock-Up Facility (SVMF)

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- Fish Astronauts on the International Space Station
- Food in Space
- Living and Working Together on the ISS!
- Martians, Earthlings and Eggstronauts
- Matter of Taste
- Microgravity and Underwater Robotics
- NASA's Educator Resource Center and You!
- Real-time Radio Observations in Astronomy
- Satellites from Start to Finish the Fun Way
- Space Launch System (SLS): Launching Beyond Earth's Orbit
- STEM on Station with NASA's Digital Learning Network
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- Space Vehicle Mock-Up Facility (SVMF) Tour

* You will not see the dive session on the on-line session selection. We will place you in the session by our staff. Please leave that time slot empty.



Join the SEEC Facebook group:

<https://www.facebook.com/groups/SEECATSCH/>