

Welcome to the 2021 GEC Conference! This year's event is fully virtual. You can access the platform at <https://apsgec2021.ispresenting.live>

When accessing the platform please use the latest version of Google Chrome, Microsoft Edge, or Mozilla Firefox.

These instructions are for the Remote Poster Presentations.



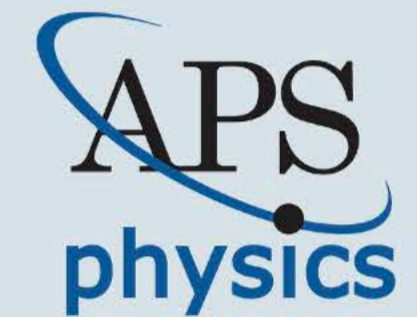
Visit the platform site at:  
<https://apsgec2021.ispresenting.live>

Click the log in button.



**74th Annual Gaseous Electronics Conference**

October 4 - 8, 2021



This platform works best on the latest versions of Google Chrome, Microsoft Edge, and Mozilla Firefox.

The login below will route you through the APS login system. Use the APS account you used to register for the conference to log in.

LOG IN



You will then be directed to enter your APS account credentials.

Click the log in button.

APS  
physics

Upcoming Events Log In Donate Now

## Welcome to My APS

Please log in or create an account to continue.

Attention: We recently upgraded our software on August 1, 2019. If you are logging in for the first time since the upgrade, you will need to reset your password by clicking on "Forgot Your Password?" Your username is the email address you provided APS.

**Log In**

Email

Password

**Log In**

[Forgot your password?](#)  
[Don't have an account?](#)

Powered by Nimble AMS



Now you are on the  
conference site platform

Click the menu button.

**GEC** 2021 APS Gaseous Electronics Conference

WELCOME HELP DESK **MENU**

Free Chat

## Welcome to the 74th Annual Gaseous Electronics Conference

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[OPEN THE SCHEDULE](#) [LEARN ABOUT OUR EXHIBITORS](#)

Type a message





MY POSTER SESSION

SCHEDULE

POSTER SESSIONS

EXHIBITORS

TECH CHECK

SIGN OUT



A drop-down menu will appear.

Click on “My Poster Session”.

## Welcome to the 74th Annual Gaseous Electronics Conference

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OPEN THE SCHEDULE

LEARN ABOUT OUR EXHIBITORS

Type a message





### Your Poster Session

Welcome to your Poster Portal!

► Learn how to use this page

### Session Details

#### Title

Your Poster Title

#### Abstract

Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisl, vehicula sed nisl id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

### Poster PDF

Please upload your poster

► Upload/Replace your PDF

### Pre-Recorded Presentation Video

► Upload a pre-recorded presentation video

### Attendee Q&A

Respond to attendee questions, or ask your own questions, here. The online counter here includes you.

1 ONLINE

Sort By Latest

Ask a question or add a comment...

Here is where you can manage your poster session. You will see some instructions, your poster title and abstract that were submitted to APS, a place to upload your pdf and optional MP4 video, finally a questions and comment area.



Click the triangle to the left of the upload/replace your pdf button.  
Please note the 25MB maximum file size.

The screenshot shows the user interface for the 2021 APS Gaseous Electronics Conference poster portal. At the top, there is a navigation bar with the GEC logo, the conference name, and links for WELCOME, HELP DESK, and MENU. Below this, there are three main navigation options: PUBLISH POSTER, START MY SESSION, and PRACTICE MY SESSION. The main content area is divided into two columns. The left column contains three sections: 'Your Poster Session' with a welcome message and a link to learn how to use the page; 'Session Details' with fields for Title and Abstract; and 'Poster PDF' with an upload button and instructions. A red arrow points to the 'Upload/Replace your PDF' button in the Poster PDF section. The right column contains an 'Attendee Q&A' section with a text input field and a 'Sort By Latest' dropdown.

**2021 APS Gaseous Electronics Conference**

WELCOME HELP DESK MENU

PUBLISH POSTER START MY SESSION PRACTICE MY SESSION

### Your Poster Session

Welcome to your Poster Portal!

► Learn how to use this page

### Session Details

**Title**  
Your Poster Title

**Abstract**  
Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisl, vehicula sed nisl id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

### Poster PDF

Please upload your poster

▼ Upload/Replace your PDF

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To replace your PDF, simply upload a new one.

**UPLOAD A PDF**

Choose File No file chosen **UPLOAD PDF**

### Attendee Q&A

Respond to attendee questions, or ask your own questions, here. The online counter here includes you.

1 ONLINE Sort By Latest ▼

Ask a question or add a comment...



Click the “Choose File”  
button.

Then navigate the pop up  
window to access the pdf you  
wish to upload.

Once selected, click the open  
button.

The screenshot shows the user interface for the 2021 APS Gaseous Electronics Conference poster portal. At the top, there is a navigation bar with the GEC logo, the conference name, and links for WELCOME, HELP DESK, and MENU. Below this is a secondary navigation bar with links for PUBLISH POSTER, START MY SESSION, and PRACTICE MY SESSION. The main content area is divided into two columns. The left column contains three sections: 'Your Poster Session' with a welcome message and a link to learn how to use the page; 'Session Details' with fields for Title and Abstract; and 'Poster PDF' with an upload area. A red arrow points to the 'Choose File' button in the 'UPLOAD A PDF' section. The right column contains an 'Attendee Q&A' section with a text input field and a 'Sort By Latest' dropdown.

**2021 APS Gaseous Electronics Conference**

WELCOME HELP DESK MENU

PUBLISH POSTER START MY SESSION PRACTICE MY SESSION

### Your Poster Session

Welcome to your Poster Portal!

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### Session Details

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**Abstract**  
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### Poster PDF

Please upload your poster

▼ Upload/Replace your PDF

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To replace your PDF, simply upload a new one.

**UPLOAD A PDF**

Choose File No file chosen **UPLOAD PDF**

### Attendee Q&A

Respond to attendee questions, or ask your own questions, here. The online counter here includes you.

1 ONLINE Sort By Latest ▼

Ask a question or add a comment...





Click the “Choose File”  
button.

Then navigate the pop up  
window to access the pdf you  
wish to upload.

Once selected, click the open  
button.

The screenshot shows a web form with several sections: **Title** (Your Poster Title), **Abstract** (Lorem ipsum text), **Poster PDF** (Please upload your poster), **Pre-Recorded Presentation Video** (Upload a pre-recorded presentation video), and **POSTER VIDEO**. A file selection dialog box is open over the **Poster PDF** section, showing a list of files with "my poster for APS.pdf" selected. A red arrow points to the "Open" button in the dialog box. Another red arrow points to the "Choose File" button in the **POSTER VIDEO** section.



Now that you have chosen a file you will see its name appear.  
Now you can click "Upload PDF."

Ask a question or add a comment...

**Title**  
Your Poster Title

**Abstract**  
Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisi, vehicula sed nisi id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

**Poster PDF**  
Please upload your poster

▼ Upload/Replace your PDF

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To replace your PDF, simply upload a new one.

**UPLOAD A PDF**

my poster for APS.pdf

**Pre-Recorded Presentation Video**

▼ Upload a pre-recorded presentation video

You have the option to upload a pre-recorded video of your presentation. This video will be available to attendees on-demand throughout the conference.

After you select your video file and click "Upload Video", please allow several minutes for your video to upload. The larger your video file is, the longer it will take for this process to complete.

**POSTER VIDEO**

No file chosen



Now that you have chosen a file you will see its name appear.  
Now you can click "Upload PDF."

Ask a question or add a comment...

**Title**  
Your Poster Title

**Abstract**  
Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisi, vehicula sed nisi id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

**Poster PDF**  
Please upload your poster

▼ Upload/Replace your PDF

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To replace your PDF, simply upload a new one.

**UPLOAD A PDF**

Choose File my poster for APS.pdf **UPLOAD PDF**

**Pre-Recorded Presentation Video**

▼ Upload a pre-recorded presentation video

You have the option to upload a pre-recorded video of your presentation. This video will be available to attendees on-demand throughout the conference.

After you select your video file and click "Upload Video", please allow several minutes for your video to upload. The larger your video file is, the longer it will take for this process to complete.

**POSTER VIDEO**

Choose File No file chosen **UPLOAD VIDEO**



Once the upload is complete you will see this pop up if the process was successful.

Click "OK."

The screenshot displays a web interface for a poster portal. At the top left, a white box contains the text "Welcome to your Poster Portal!" with a link "Learn how to use this page". A "Success!" notification box is overlaid on the page, featuring a blue "OK" button, which is highlighted by a red arrow. Below the welcome message is a "Session Details" form with fields for "Title" (containing "Your Poster Title") and "Abstract" (containing placeholder text). To the right of the form is a "Sort By Latest" dropdown menu. Below the form is a "Poster PDF" section with instructions on how to upload or replace a PDF file. At the bottom of this section, there is an "UPLOAD A PDF" button and a "Choose File" button next to the filename "my poster for APS.pdf".



Optionally, you may add an MP4 video as well. Click the triangle under the “Pre-Recorded Presentation Video”. Navigate to the MP4 on your computer.

Select open.

Ask a question or add a comment...

**Title**  
Your Poster Title

**Abstract**  
Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisl, vehicula sed nisl id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

**Poster PDF**  
Please upload your poster

▼ Upload/Replace your PDF

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To replace your PDF, simply upload a new one.

**UPLOAD A PDF**

Choose File my poster for APS.pdf **UPLOAD PDF**

**Pre-Recorded Presentation Video**

▼ Upload a pre-recorded presentation video

You have the option to upload a pre-recoded video of your presentation. This video will be available to attendees on-demand throughout the conferece.

After you select your video file and click "Upload Video", please allow several minutes for your video to upload. The larger your video file is, the longer it will take for this process to complete.

**POSTER VIDEO**

Choose File No file chosen **UPLOAD VIDEO**



Optionally, you may add an MP4 video as well. Click the triangle under the “Pre-Recorded Presentation Video”. Navigate to the MP4 on your computer.

Select open.

Ask a question or add a comment...

**Title**  
Your Poster Title

**Abstract**  
Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisl, vehicula sed nisl id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

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To replace your PDF, simply upload a new one.

**UPLOAD A PDF**

Choose File my poster for APS.pdf **UPLOAD PDF**

**Pre-Recorded Presentation Video**

▼ Upload a pre-recorded presentation video

You have the option to upload a pre-recorded video of your presentation. This video will be available to attendees on-demand throughout the conferece.

After you select your video file and click "Upload Video", please allow several minutes for your video to upload. The larger your video file is, the longer it will take for this process to complete.

**POSTER VIDEO**

Choose File No file chosen **UPLOAD VIDEO**



Optionally, you may add an MP4 video as well. Click the triangle under the “Pre-Recorded Presentation Video”. Navigate to the MP4 on your computer.

Select open.

The screenshot shows a web interface for uploading a poster and a pre-recorded presentation video. The form includes sections for 'Title', 'Abstract', 'Poster PDF', and 'Pre-Recorded Presentation Video'. A file selection dialog is open over the 'Pre-Recorded Presentation Video' section, showing a list of files in a folder named 'my APS MP4 video'. The file 'my APS poster video.mp4' is selected. A red arrow points to the 'Open' button in the dialog. Another red arrow points to the 'Choose File' button in the 'POSTER VIDEO' section of the form.

**Title**  
Your Poster Title

**Abstract**  
Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisl, vehicula sed nisl id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien. Vestibulum a nulla mauris. Nullam fermentum sollicitudin nec euismod.

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To replace your PDF, simply upload a new PDF file.

**UPLOAD A PDF**  
 my poster for APS.pptx

**Pre-Recorded Presentation Video**  
▼ Upload a pre-recorded presentation video

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After you select your video file and click "Upload Video", please allow several minutes for your video to upload. The larger your video file is, the longer it will take for this process to complete.

**POSTER VIDEO**  
 No file chosen

Once selected, click “Upload Video.”

Stay on this page until the video is fully uploaded.

Do not be alarmed if you see a player error message.

Once your file has been uploaded it will take some time to render a preview but you do not need to stay on this page for that to process complete.

Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisl, vehicula sed nisl id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

#### Poster PDF

Your PDF is online! [View it here in a new tab](#)

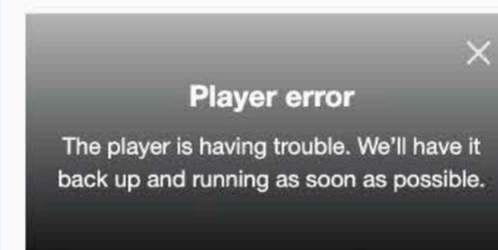
► Upload/Replace your PDF

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If this video player says "Not ready" or "The player is having trouble", that means video is still being processed in the cloud. It may take up to an hour to finish processing.

Try refreshing the page. Once you can see the uploaded video here, then it's safe to publish your booth—otherwise attendees will not be able to play your video.

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Choose File No file chosen

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#### Poster PDF

Your PDF is online! [View it here in a new tab](#)

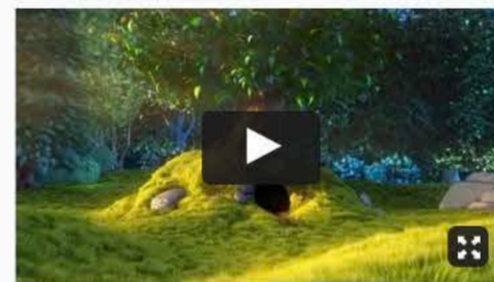
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#### POSTER VIDEO

Choose File No file chosen

UPLOAD VIDEO





### Troubleshooting / Viewing Tips

1. Make sure **cookies** are enabled.
2. Make sure any **privacy extensions** are disabled for this site.
3. Make sure you're **not connected to a VPN**.
4. Close all unnecessary apps and programs.
5. A dedicated internet connection is ideal.
6. Try **refreshing the page** if experiencing issues.
7. This site works best using the latest version of **Google Chrome** or **Microsoft Edge**.

### Support Chat

Support chat does not work in **private browsing mode**, if a **privacy browser extension is enabled**, or if **cookies are disabled**.

The Safari browser may have cookies disabled by default. Please try using Chrome or Edge.

OPEN SUPPORT CHAT



If you have trouble in this process, click the “Help Desk” button.

At the bottom of the page you can open a support chat. There you can send an email and you will be contacted shortly.



### Troubleshooting / Viewing Tips

1. Make sure **cookies** are enabled.
2. Make sure any **privacy extensions** are disabled for this site.
3. Make sure you're **not connected to a VPN**.
4. Close all unnecessary apps and programs.
5. A dedicated internet connection is ideal.
6. Try **refreshing the page** if experiencing issues.
7. This site works best using the latest version of **Google Chrome** or **Microsoft Edge**.


### Support Chat

Support chat does not work in **private browsing mode**, if a **privacy browser extension is enabled**, or if **cookies are disabled**.

The Safari browser may have cookies disabled by default. Please try using Chrome or Edge.

OPEN SUPPORT CHAT




Live Chat Offline 

We are offline. Please leave a message.

Email

Message text





If you have trouble in this process, click the “Help Desk” button.  
At the bottom of the page you can open a support chat.  
There you can send an email and you will be contacted shortly.

Once you have uploaded your pdf (and a video if you so choose) it is time to publish these to the platform for all attendees to see. Click the “Publish Poster” tab. A pop up will confirm that you wish to continue publishing your Poster Session. Click “OK” to confirm.

The screenshot shows the user interface for the 2021 APS Gaseous Electronics Conference poster portal. At the top, there is a navigation bar with the GEC logo, the conference name, and links for WELCOME, HELP DESK, and MENU. Below this, a secondary navigation bar contains the main menu items: PUBLISH POSTER (highlighted in yellow and pointed to by a red arrow), START MY SESSION, and PRACTICE MY SESSION. The main content area is divided into several sections: 1. 'Your Poster Session' with a 'Welcome to your Poster Portal!' message and a link to 'Learn how to use this page'. 2. 'Session Details' with a 'Title' field containing 'Your Poster Title' and an 'Abstract' field containing placeholder text. 3. 'Poster PDF' with a message 'Your PDF is online! View it here in a new tab' and a link to 'Upload/Replace your PDF'. 4. 'Pre-Recorded Presentation Video' with a link to 'Upload a pre-recorded presentation video'. On the right side, there is an 'Attendee Q&A' section with a '1 ONLINE' indicator, a 'Sort By Latest' dropdown, and a text input field for asking questions or adding comments.



Once you have uploaded your pdf (and a video if you so choose) it is time to publish these to the platform for all attendees to see.

Click the “Publish Poster” tab. A pop up will confirm that you wish to continue publishing your Poster Session.

Click “OK” to confirm.

The screenshot shows a web interface for the 2021 APS GEC. The main content area is divided into several sections:

- Your Poster:** Includes a "Welcome to you" message and a link to "Learn how to u".
- Session Details:** Contains a "Title" field with the placeholder "Your Poster Title" and an "Abstract" section with placeholder text.
- Poster PDF:** States "Your PDF is online! [View it here in a new tab](#)" and includes a link to "Upload/Replace your PDF".
- Pre-Recorded Presentation Video:** Includes a link to "Upload a pre-recorded presentation video".

A modal dialog box is displayed over the top right of the page, containing the text: "Publish this booth so that attendees see it listed on the Poster Sessions page?". Below the text are two buttons: "Cancel" and "OK". A red arrow points to the "OK" button.



Now you may check back to this page to see if any questions or comments have come in. You can leave your own comments here and respond to questions directly. Keep in mind these will be seen by all attendees that access your poster session.

The screenshot displays the user interface for a poster session. At the top, the GEC logo and conference name are visible, along with navigation links for 'WELCOME', 'HELP DESK', and 'MENU'. Below the header, there are three main sections: 'Your Poster Session', 'Attendee Q&A', and a 'Pre-Recorded Presentation Video' section. The 'Your Poster Session' section includes a welcome message, a link to learn how to use the page, session details (Title and Abstract), a 'Poster PDF' link, and an option to upload a pre-recorded presentation video. The 'Attendee Q&A' section is highlighted with a red border and contains a text input field for asking questions or adding comments, a list of two online attendees (Andy Bloomberg and John Hall) with their questions and reply options, and a 'Sort By Latest' dropdown menu. Red arrows point to the input field and the 'Reply' button for John Hall's question.

**2021 APS Gaseous Electronics Conference** WELCOME HELP DESK MENU

UNPUBLISH POSTER START MY SESSION PRACTICE MY SESSION

### Your Poster Session

Welcome to your Poster Portal!

► Learn how to use this page

#### Session Details

**Title**  
Your Poster Title

**Abstract**  
Here is where the abstract for your Poster Session would be. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean pellentesque et nisi eu congue. Donec vel leo egestas, tempor nunc eget, gravida dolor. Donec sit amet lobortis quam, dapibus pulvinar sem. Praesent consequat luctus mauris nec mattis. Ut justo nisi, vehicula sed nisi id, mattis finibus arcu. Sed semper, augue vel tempor venenatis, lectus risus maximus magna, ut aliquam urna eros et lacus. In aliquam elit sit amet nibh ultricies convallis. Morbi eget quam lacinia, bibendum quam ac, sollicitudin tortor. Vestibulum a nulla mauris. Nullam sagittis eget mauris eu cursus. Cras mattis, ex quis iaculis tincidunt, nibh tellus mattis nibh, at placerat dolor sapien at sem. Proin quis neque id augue fermentum sollicitudin nec euismod metus.

**Poster PDF**  
Your PDF is online! [View it here in a new tab](#)

► Upload/Replace your PDF

**Pre-Recorded Presentation Video**  
► Upload a pre-recorded presentation video

### Attendee Q&A

Respond to attendee questions, or ask your own questions, here. The online

2 ONLINE • Sort By Latest ▾

Ask a question or add a comment...

Andy Bloomberg Just Now  
Hello, I have a question about this poster  
Reply Edit Delete 0

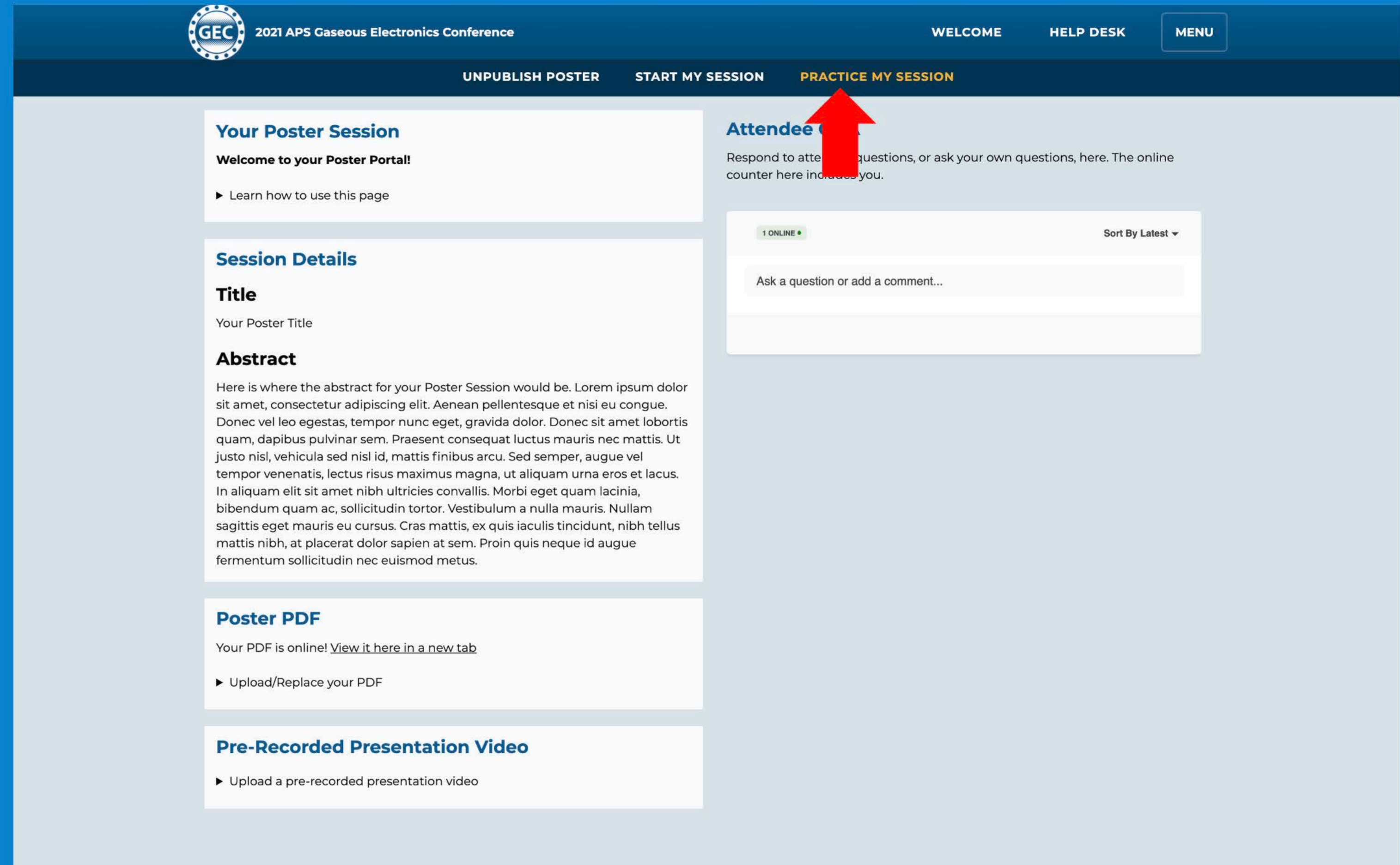
John Hall Just Now  
I have a question!  
Reply 0



Before the day of your live session it is recommended that you do a practice session.

In there you can verify that your mic and camera settings are working.

Keep in mind during the live session you will need to screen share your pdf as well. Here you can practice that and verify your settings.



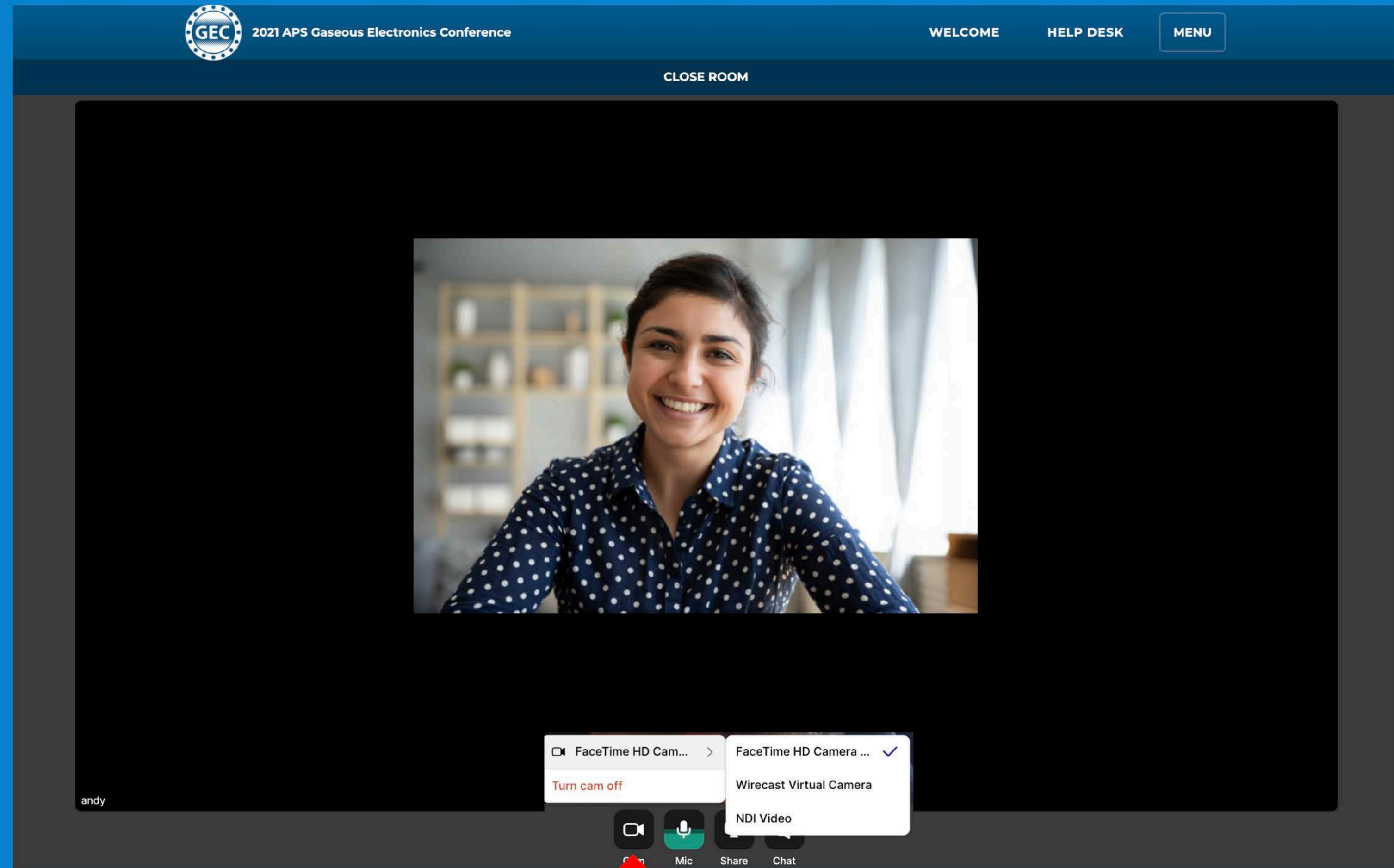
The screenshot displays the user interface for the 2021 APS Gaseous Electronics Conference. At the top, the GEC logo and conference name are visible, along with navigation links for 'WELCOME', 'HELP DESK', and 'MENU'. Below this, a secondary navigation bar includes 'UNPUBLISH POSTER', 'START MY SESSION', and 'PRACTICE MY SESSION'. The main content area is divided into several sections:

- Your Poster Session:** A welcome message to the poster portal with a link to learn how to use the page.
- Session Details:** A section for entering the poster title and abstract. The abstract field contains placeholder text.
- Poster PDF:** A section indicating that the poster PDF is online and providing a link to view it, along with an option to upload or replace the PDF.
- Pre-Recorded Presentation Video:** A section for uploading a pre-recorded presentation video.
- Attendee:** A section for interacting with other attendees. It shows '1 ONLINE' and a 'Sort By Latest' dropdown. Below this is a text input field for asking questions or adding comments.



Make sure your browser has permission to share your camera and microphone.

At the bottom of this window click the “Cam” button to select the webcam you wish to use for the live portion of your session.

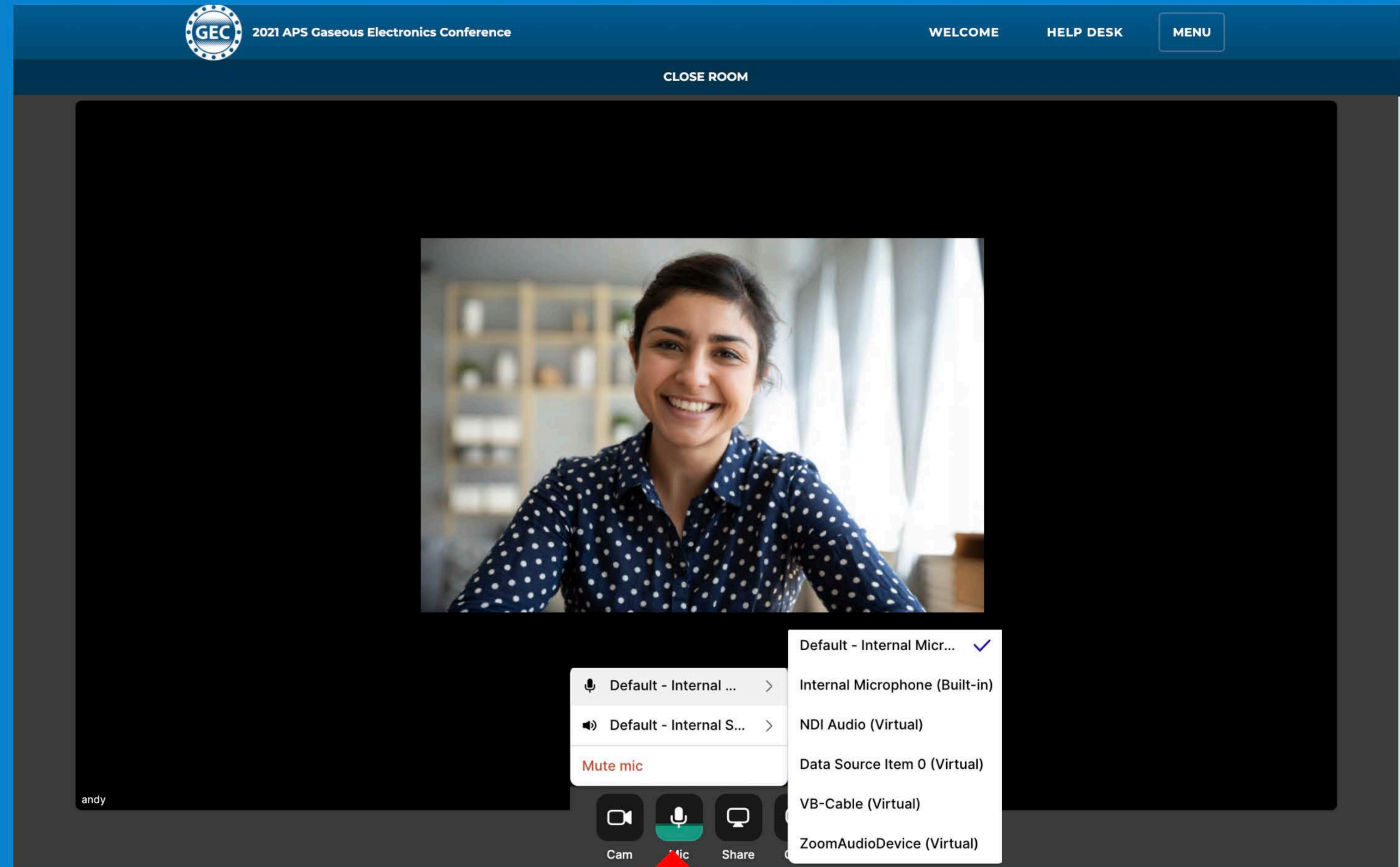


The screenshot shows a Zoom meeting window. At the top, there is a header with the GEC logo, the text "2021 APS Gaseous Electronics Conference", and navigation links for "WELCOME", "HELP DESK", and "MENU". Below the header is a "CLOSE ROOM" button. The main area contains a video feed of a smiling woman with dark hair wearing a blue polka-dot shirt. At the bottom of the window, there is a toolbar with icons for "Cam", "Mic", "Share", and "Chat". A red arrow points to the "Cam" icon. A context menu is open over the "Cam" icon, showing a list of camera options: "FaceTime HD Cam...", "Turn cam off", "FaceTime HD Camera ...", "Wirecast Virtual Camera", and "NDI Video". The name "andy" is visible in the bottom left corner of the meeting area.





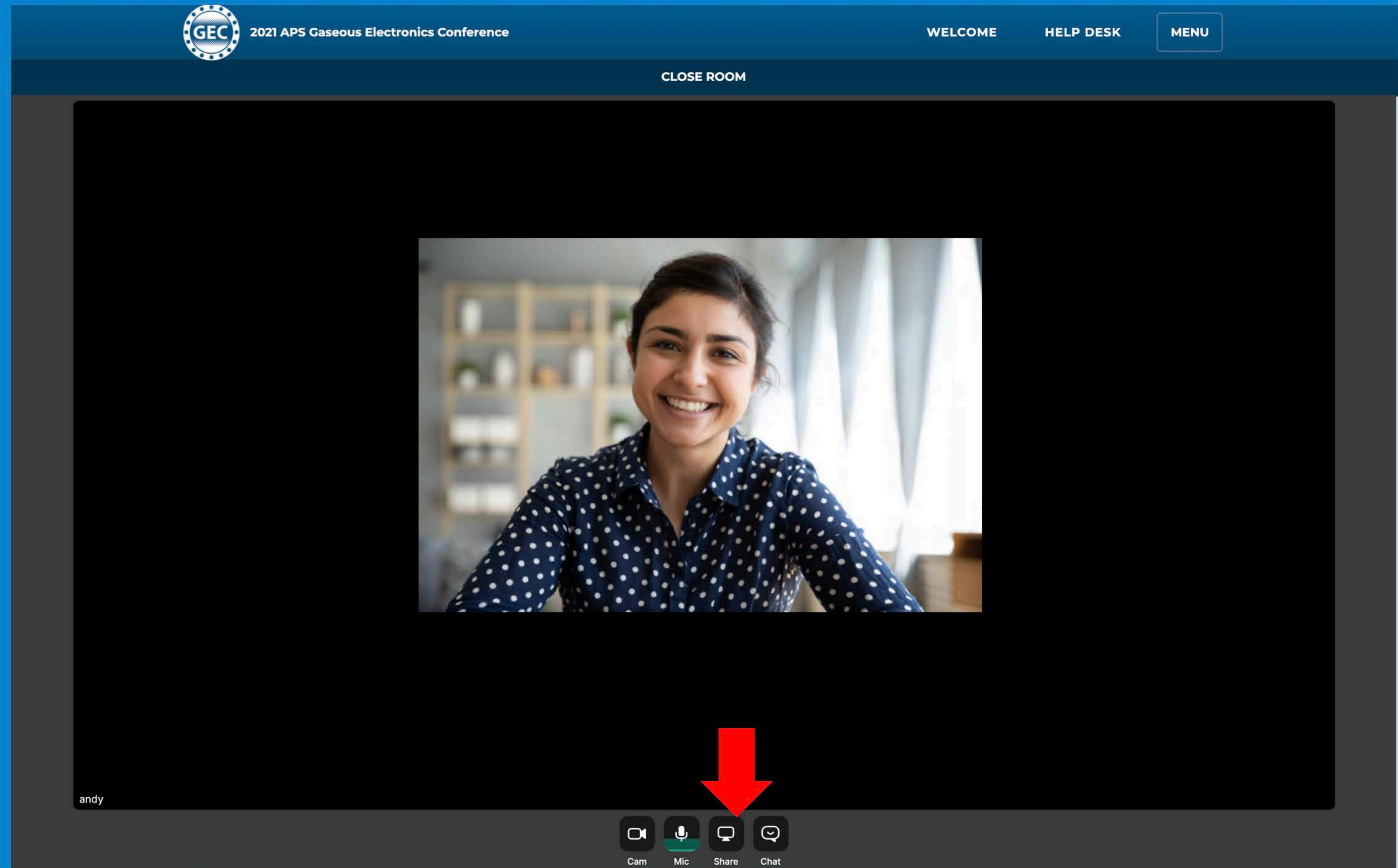
At the bottom of this page click the “Mic” button to select the microphone and speakers you wish to use for the live portion of your session.



Have your poster pdf open and on the same screen as the web browser you are using.

Select the “Share” button at the bottom of the page.

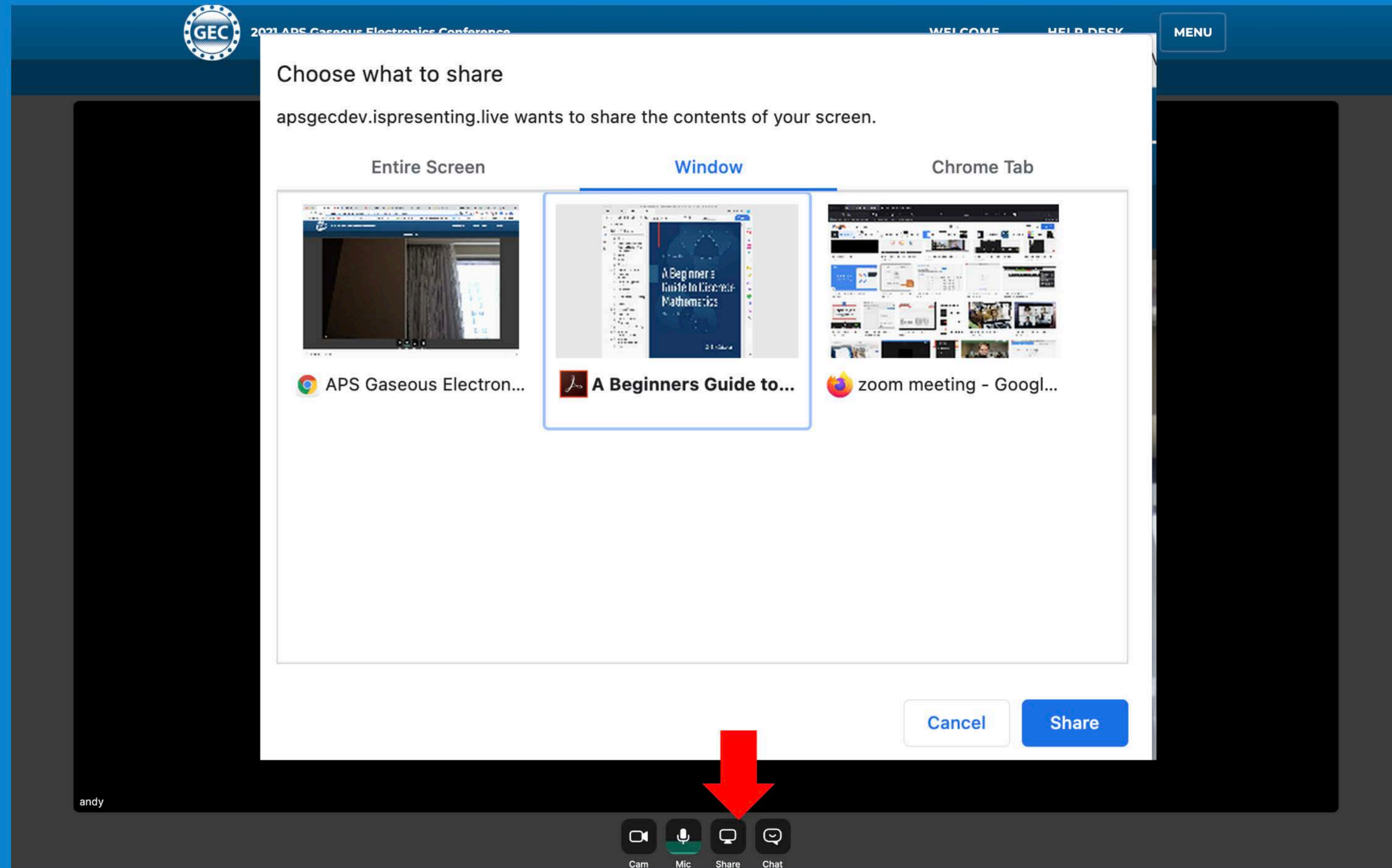
Navigate to the window. Select your poster pdf and click the “Share” button.



Have your poster pdf open and on the same screen as the web browser you are using.

Select the “Share” button at the bottom of the page.

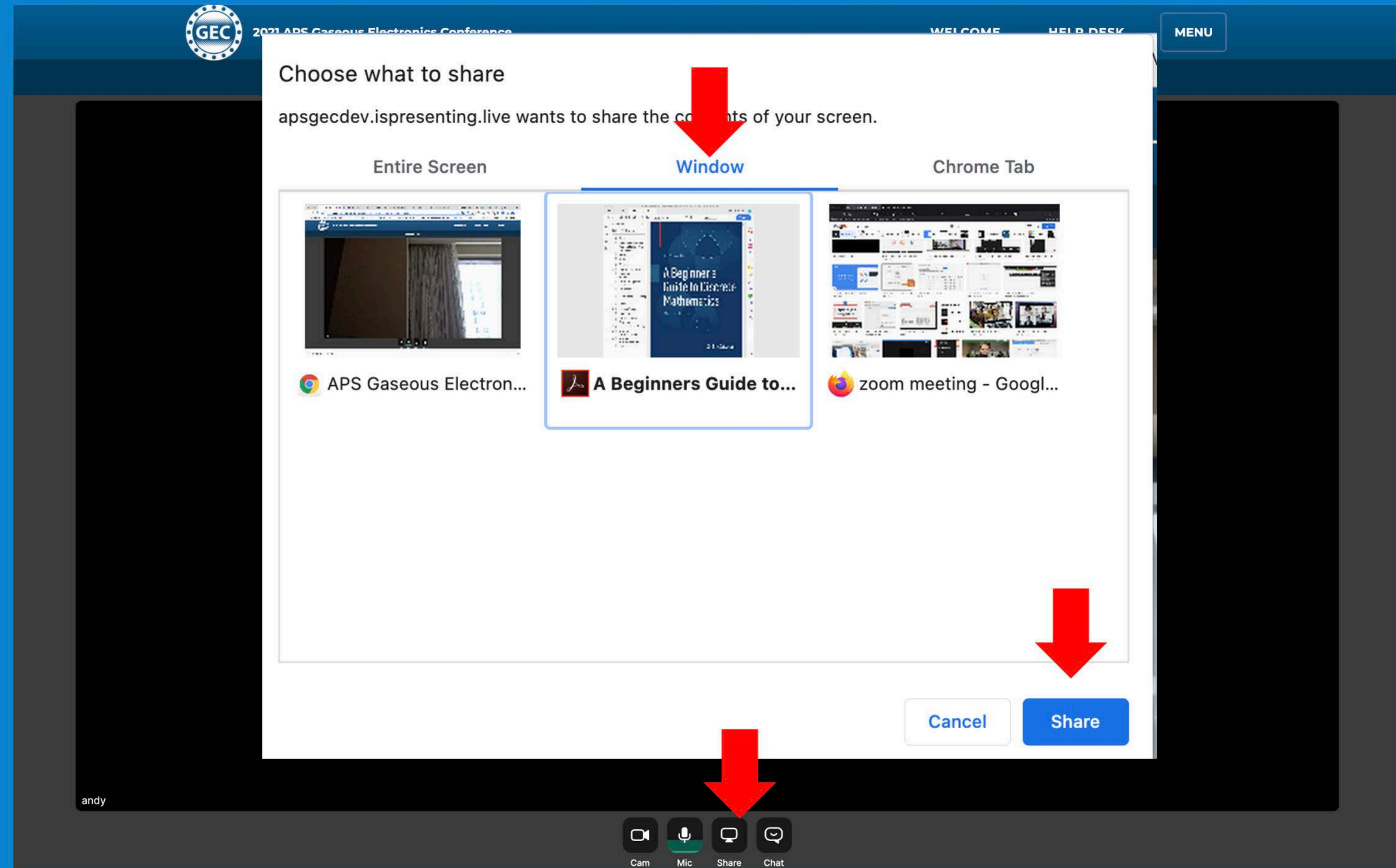
Navigate to the window. Select your poster pdf and click the “Share” button.



Have your poster pdf open and on the same screen as the web browser you are using.

Select the “Share” button at the bottom of the page.

Navigate to the window. Select your poster pdf and click the “Share” button.



This is how attendees will see your poster pdf and web cam. When you scroll through your poster pdf on your computer, everyone in the room with you will be able to see. You will be able to hear everyone in the room who has their mic on and see the first 11 attendees that enter and enable their camera. The room does allow up to 100 viewers at one time.

2021 APS Gaseous Electronics Conference

WELCOME HELP DESK MENU

CLOSE ROOM

A Beginners Guide to Discrete Mathematics Second Edition by W.D. Wallis.pdf

Home Tools A Beginners Guid... x

95 (110 of 442) 91.4%

Share

4.1 Relations 95

**Sample Problem 4.2.** Suppose  $R = \{1, 2\}$ ,  $S = \{3, 4, 5\}$ , and  $T = \{6, 7\}$ . The binary relations  $\tau$  from  $R$  to  $S$ ,  $\rho$  from  $S$  to  $T$ , and  $\sigma$  from  $S$  to  $T$  are defined by

$$\begin{aligned}\tau &= \{(1, 3), (2, 4), (2, 5)\}, \\ \rho &= \{(3, 6), (3, 7), (5, 7)\}, \\ \sigma &= \{(3, 6), (4, 6), (4, 7)\}.\end{aligned}$$

What are the binary relations  $\tau\rho$ ,  $\rho\sigma$  and  $\rho\cap\sigma$ ?

**Solution.** The relations are as follows:

$$\begin{aligned}\tau\rho &= \{(1, 6), (1, 7)\}, \\ \rho\sigma & \text{ is not defined as } T \text{ is not equal to } S, \\ \rho\cap\sigma &= \{(3, 6)\}.\end{aligned}$$

**Practice Exercise.** What are the binary relations  $\rho\tau$ ,  $\tau\sigma$  and  $\rho\cup\sigma$ ?

**Theorem 21.** Composition of binary relations is associative: if  $\alpha$ ,  $\beta$ , and  $\gamma$  are given binary relations and if either of the compositions  $\alpha(\beta\gamma)$  and  $(\alpha\beta)\gamma$  exists, then so does the other, and  $\alpha(\beta\gamma) = (\alpha\beta)\gamma$ .

**Proof.** Let  $Q, R, S, T$  be sets where  $\alpha \subseteq Q \times R$ ,  $\beta \subseteq R \times S$ , and  $\gamma \subseteq S \times T$ . Suppose there are some elements  $q \in Q$  and  $t \in T$  that satisfy  $q(\alpha\beta)\gamma t$ . Then by the definition of composition there exists an  $s \in S$  such that  $q\alpha s$  and  $s\gamma t$ . Again by the definition, there exists  $r \in R$  such that  $q\alpha r$  and  $r\beta s$ . But now since  $r\beta s$  and  $s\gamma t$ , it follows that  $r\beta\gamma t$ , and since  $q\alpha r$ , we have  $q\alpha(\beta\gamma)t$ . Hence  $(\alpha\beta)\gamma \subseteq \alpha(\beta\gamma)$ . A similar argument shows that  $\alpha(\beta\gamma) \subseteq (\alpha\beta)\gamma$  and therefore the two compositions are equal.  $\square$

Every binary relation has an *inverse relation*: if  $\alpha$  is a binary relation from  $S$  to  $T$ , so that  $\alpha \subseteq S \times T$ , then  $\alpha^{-1}$  is a binary relation from  $T$  to  $S$ , or  $\alpha^{-1} \subseteq T \times S$ , defined by

$$\alpha^{-1} = \{(t, s) : (s, t) \in \alpha\}.$$

In other words,  $t\alpha^{-1}s$  if and only if  $s\alpha t$ .

**Sample Problem 4.3.** What is the inverse relation of  $\tau$ , in the preceding Sample Problem?

**Solution.**  $\tau^{-1} = \{(3, 1), (4, 2), (5, 2)\}$ .

**Practice Exercise.** What is the inverse relation of  $\rho$  in the preceding Sample Problem?

The inverse of a composition may be expressed as a composition of inverses.

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When you are comfortable with this process you may close the room.

CLOSE ROOM

A Beginners Guide to Discrete Mathematics Second Edition by W.D. Wallis.pdf

Home Tools A Beginners Guid... x

95 (110 of 442) 91.4%

4.1 Relations 95

**Sample Problem 4.2.** Suppose  $R = \{1, 2\}$ ,  $S = \{3, 4, 5\}$ , and  $T = \{6, 7\}$ . The binary relations  $\tau$  from  $R$  to  $S$ ,  $\rho$  from  $S$  to  $T$ , and  $\sigma$  from  $S$  to  $T$  are defined by

$$\tau = \{(1, 3), (2, 4), (2, 5)\},$$

$$\rho = \{(3, 6), (3, 7), (5, 7)\},$$

$$\sigma = \{(3, 6), (4, 6), (4, 7)\}.$$

What are the binary relations  $\tau\rho$ ,  $\rho\sigma$  and  $\rho\cap\sigma$ ?

**Solution.** The relations are as follows:

$$\tau\rho = \{(1, 6), (1, 7)\},$$

$\rho\sigma$  is not defined as  $T$  is not equal to  $S$ .

$$\rho\cap\sigma = \{(3, 6)\}.$$

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**Theorem 21.** Composition of binary relations is associative: if  $\alpha$ ,  $\beta$ , and  $\gamma$  are given binary relations and if either of the compositions  $\alpha(\beta\gamma)$  and  $(\alpha\beta)\gamma$  exists, then so does the other, and  $\alpha(\beta\gamma) = (\alpha\beta)\gamma$ .

**Proof.** Let  $Q, R, S, T$  be sets where  $\alpha \subseteq Q \times R$ ,  $\beta \subseteq R \times S$ , and  $\gamma \subseteq S \times T$ . Suppose there are some elements  $q \in Q$  and  $t \in T$  that satisfy  $q(\alpha\beta)\gamma t$ . Then by the definition of composition there exists an  $s \in S$  such that  $q\alpha s$  and  $s\gamma t$ . Again by the definition, there exists  $r \in R$  such that  $q\alpha r$  and  $r\beta s$ . But now since  $r\beta s$  and  $s\gamma t$ , it follows that  $r\beta\gamma t$ , and since  $q\alpha r$ , we have  $q\alpha(\beta\gamma)t$ . Hence  $(\alpha\beta)\gamma \subseteq \alpha(\beta\gamma)$ . A similar argument shows that  $\alpha(\beta\gamma) \subseteq (\alpha\beta)\gamma$  and therefore the two compositions are equal.  $\square$

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The inverse of a composition may be expressed as a composition of inverses.

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When you are comfortable with this process you may close the room.

CLOSE ROOM

A screenshot of a PDF viewer displaying a page from 'A Beginners Guide to Discrete Mathematics' by W.D. Wallis. The page is titled '4.1 Relations' and contains several mathematical problems and solutions. A red arrow points to the 'CLOSE ROOM' button located above the PDF viewer. The PDF content includes:

**Sample Problem 4.2.** Suppose  $R = \{1, 2\}$ ,  $S = \{3, 4, 5\}$ , and  $T = \{6, 7\}$ . The binary relations  $\tau$  from  $R$  to  $S$ ,  $\rho$  from  $S$  to  $T$ , and  $\sigma$  from  $S$  to  $T$  are defined by

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What are the binary relations  $\tau\rho$ ,  $\rho\sigma$  and  $\rho\cap\sigma$ ?

**Solution.** The relations are as follows:

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**Proof.** Let  $Q, R, S, T$  be sets where  $\alpha \subseteq Q \times R$ ,  $\beta \subseteq R \times S$ , and  $\gamma \subseteq S \times T$ . Suppose there are some elements  $q \in Q$  and  $t \in T$  that satisfy  $q(\alpha\beta)\gamma t$ . Then by the definition of composition there exists an  $s \in S$  such that  $q\alpha s$  and  $s\gamma t$ . Again by the definition, there exists  $r \in R$  such that  $q\alpha r$  and  $r\beta s$ . But now since  $r\beta s$  and  $s\gamma t$ , it follows that  $r\beta\gamma t$ , and since  $q\alpha r$ , we have  $q\alpha(\beta\gamma)t$ . Hence  $(\alpha\beta)\gamma \subseteq \alpha(\beta\gamma)$ . A similar argument shows that  $\alpha(\beta\gamma) \subseteq (\alpha\beta)\gamma$  and therefore the two compositions are equal.  $\square$

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**Practice Exercise.** What is the inverse relation of  $\rho$  in the preceding Sample Problem?

The inverse of a composition may be expressed as a composition of inverses.



Cam Mic Stop Chat



On the day of your live poster session, click the “Start My Session” tab a few minutes before your scheduled time.

The screenshot displays the conference website interface. At the top left is the GEC logo and the text "2021 APS Gaseous Electronics Conference". On the top right are links for "WELCOME", "HELP DESK", and a "MENU" button. Below this is a navigation bar with three tabs: "UNPUBLISH POSTER", "START MY SESSION" (highlighted with a red arrow), and "PRACTICE MY SESSION".

The main content area is divided into two columns. The left column contains three sections: "Your Poster Session" with a "Welcome to your Poster Portal!" message and a link to "Learn how to use this page"; "Session Details" with a "Title" field containing "Andy Bloomberg's Poster Title" and an "Abstract" field with placeholder text; and "Poster PDF" with a message "Your PDF is online! [View it here in a new tab](#)" and a link to "Upload/Replace your PDF".

The right column is titled "Attendee Q&A" and includes the instruction "Respond to attendee questions, or ask your own questions, here. The online counter here includes you." Below this is a "1 ONLINE" indicator and a "Sort By Latest" dropdown. A text input field prompts the user to "Ask a question or add a comment...". Two example questions are shown: one by "Andy Bloomberg" (3 hours ago) asking "Hello, I have a question about this poster" with "Reply", "Edit", and "Delete" options and a thumbs-up icon showing 0; and another by "John Hall" (3 hours ago) asking "I have a question!" with a "Reply" option and a thumbs-up icon showing 1.





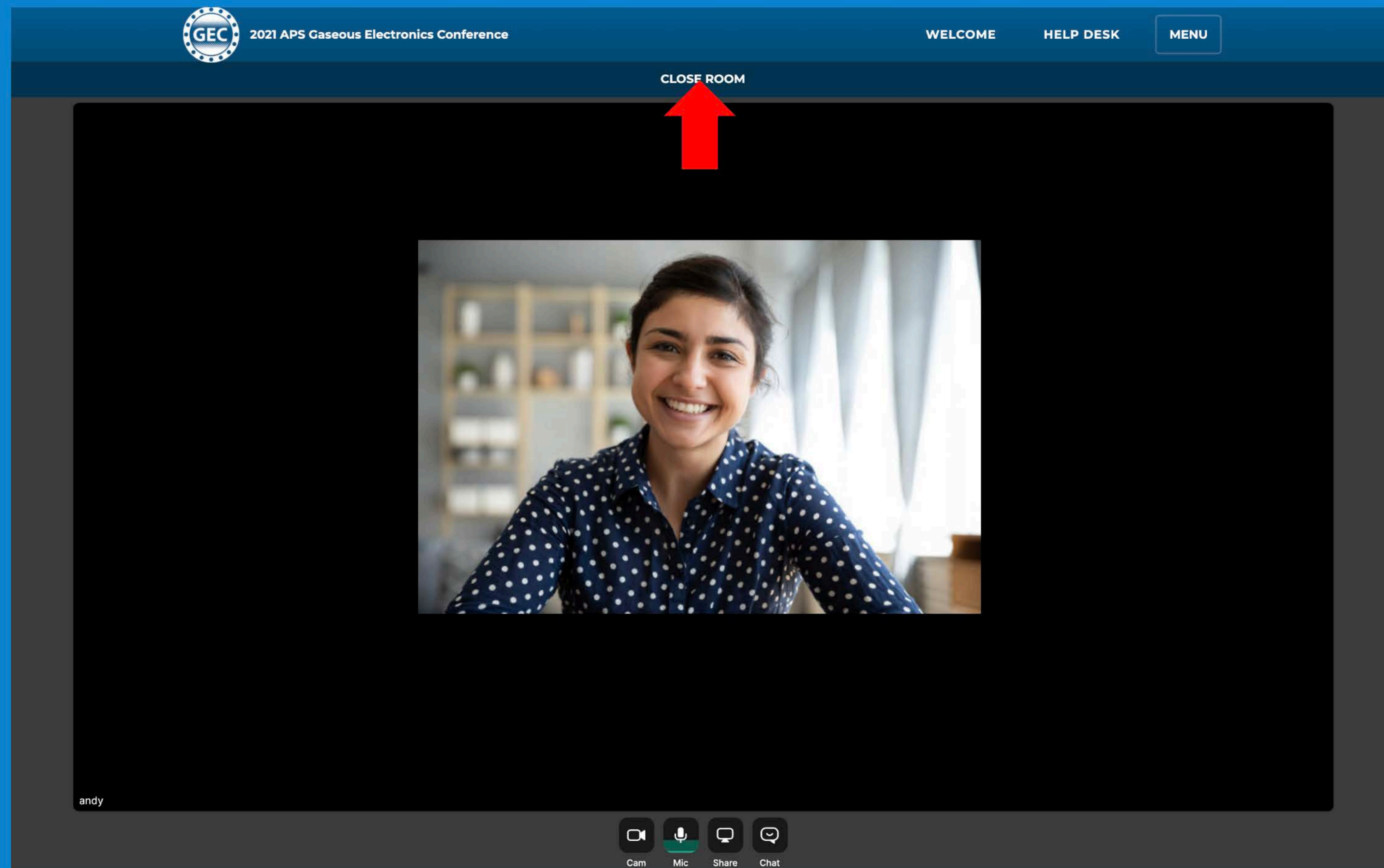
From here the process is identical to the practice session.

You can verify your cam and mic settings, setup your screen share and open the “Chat” tab to answer text questions.

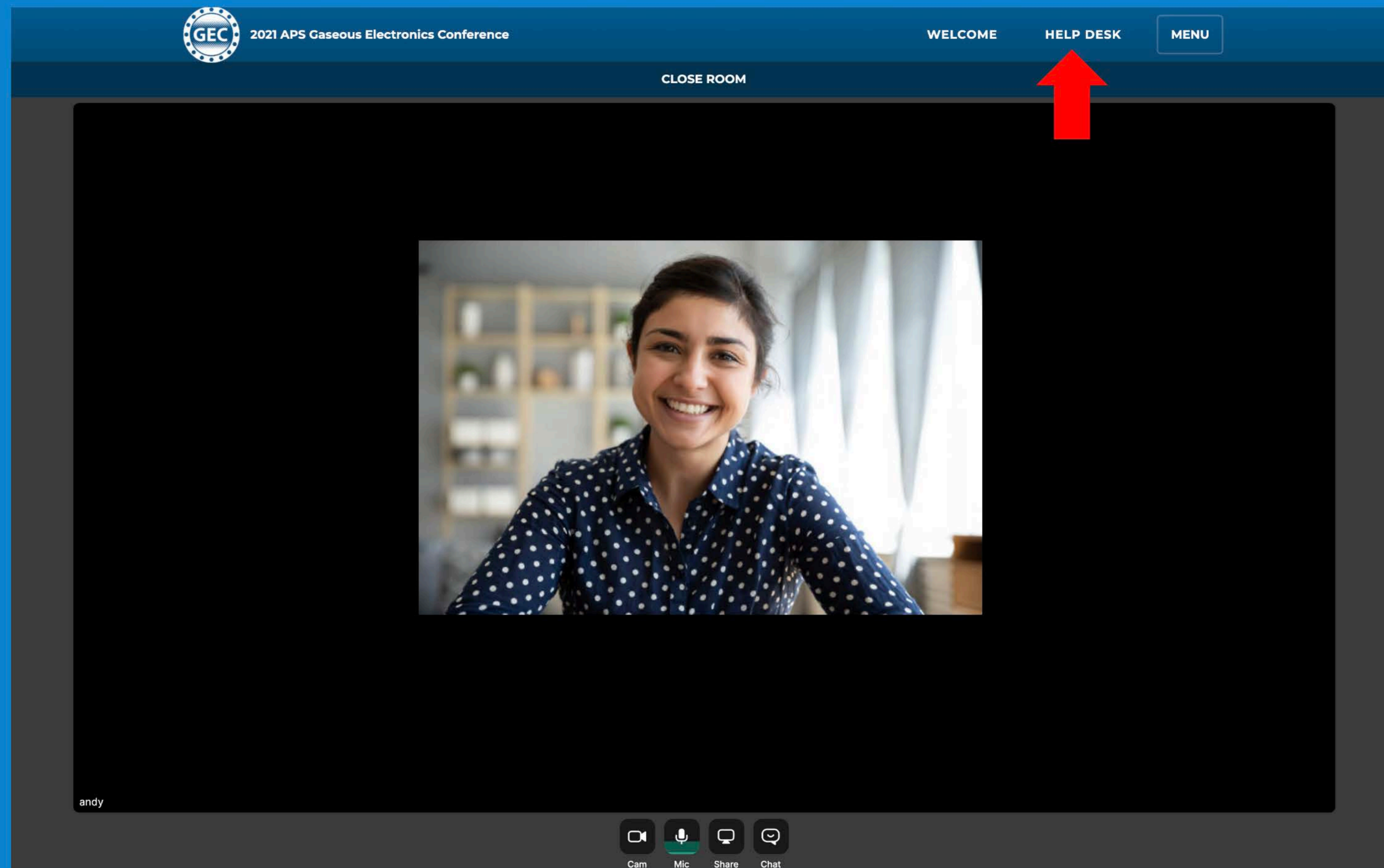
The screenshot displays the Zoom meeting interface. At the top, the header includes the GEC logo, the text "2021 APS Gaseous Electronics Conference", and navigation links for "WELCOME", "HELP DESK", and "MENU". Below the header is a "CLOSE ROOM" button. The main area features a video feed of a woman with dark hair, wearing a blue polka-dot shirt, smiling. To the right of the video is a chat window with tabs for "Chat" and "People". The chat window shows a message from "andy" saying "Hello!" and a "Send" button. At the bottom of the screen is a control bar with icons for "Cam", "Mic", "Share", and "Chat". A red arrow points to the "Chat" icon.



When your time has concluded simply click the “Close Room” tab. Now you can return to the platform.



If at any time you experience technical difficulties, click the “Help Desk” tab and a live support agent will be there to help and if necessary, join your poster session to assist.



Thank you for your participation in this year's poster sessions!

