

Sandra Cruz-Pol:

Hello, everybody. My name is Sandra Cruz-Pol, and I'm a Program Director for the Engineering Research Centers, or ERC, at the US National Science Foundation, NSF. And I'm also the international Center-to-Center or C2C Liaison. First of all, I want to thank you all for participating in the webinar of our new NSF ERC portal for international research collaborations. We're very happy and excited about this new tool, because we know that international collaborations help advance the frontiers of science, technology, and engineering. And are also vital for preparing a globally engaged science and engineering workforce. Today, after a short introduction, we will have a concise description of the NSF Office of International Science and Engineering. Then, describe how the portal was originated from the NSF ERC program, and the C2C mechanism. And finally, we'll proceed to the demo of the portal, so we can get your feedback. After all of this, we'll have a few minutes for answering your questions.

Sandra Cruz-Pol:

So this is a screenshot of the portal that we will demo today. It will be housed in the erc-association.org website, and up and running by early this summer. This new online tool is meant to be a resource to facilitate international collaboration among Engineering Research Centers and researchers. The idea of the portal originated from feedback from the international community that participated in the second NSF C2C workshop in 2019. It will include information about resources found all over the world, as well as information on current NSF opportunities for international research collaborations. And to explain more about that, I will leave you now with Roxanne Nikolaus from NSF OISE, who has graciously agreed to present a brief description of this NSF Office.

Roxanne Nikolaus:

Thank you, Sandra, and thank you all for spending a little part of your day with us today. So as Sandra said, I am from the NSF Office of International Science and Engineering, also known as OISE. This slide is a quick listing of the many things that the office does, but the bold text at the top is the summary, we're the focal point for international collaboration inside NSF and outside NSF. We work quite a bit with the NSF research directorates, and quite a bit with our funding counterparts overseas, with the state department, of course. Basically, on building collaborations, maintaining relationships and partnerships, helping to facilitate engagement between US researchers, and researchers overseas. So for the purpose of this presentation, I'm going to share just two slides with you, focused on funding programs that facilitate international collaboration. So this slide shows the three funding programs within OISE, the international office at NSF. You can find out more information about these programs just by doing a quick web search for NSF, and then the name of the program, or the acronym that you see there.

Roxanne Nikolaus:

Just very quickly, what we have at the top there is IRES, and as the name says, this is an opportunity for US students to gain meaningful research experience overseas, being mentored by an international PI, and working with students in another country. The second one there called PIRE, the main point of this program is to bring together US researchers with researchers from overseas, to tackle a research question that could not be done without that International collaboration. That program PIRE is on a bit of a pause right now, but we expect it to come back around. So I would say watch for information on that program re-emerging. And then the final one there is called AccelNet. The point of AccelNet is not necessarily to fund the research itself, but it's to fund opportunities to make connections between researchers in the US, and researchers in other countries. So I call it the connective tissue. So AccelNet funds that connective tissue between researchers. And then the final slide is really to demonstrate that

while OISE does have some funding programs, most of the international collaboration opportunities really come through the seven research directorates at NSF.

Roxanne Nikolaus:

So just a few examples here, we have dear colleague letters that explain specialized opportunities. You can see a couple of examples there on training and education, ones specific to our chemistry division. We also have formal, what we call agency-to-agency collaborations. And NSF has entered into a formal engagement with one of our funding counterparts. So you can see we have Europe, the UK, Israel, and those are just a few examples. And finally, another mechanism that we use are special solicitations. Special solicitations spell out a specific opportunity in a certain area of research, or a certain field. So you can see there, another few examples of infectious disease, which is unfortunately very timely right now. Computational neuroscience, biodiversity, those are just a few examples. So again, you can get more information on these specific opportunities by doing a search, and OISE is always happy to answer any questions. We have a staff webpage where you can find folks who work on certain countries and regions.

Sandra Cruz-Pol:

Thank you so much, Roxanne. And to go on, as I said, this portal originated from the feedback from the international community at the NSF ERC C2C workshop. The NSF established the Engineering Research Centers program 35 years ago, in order to advance collaborative, interdisciplinary, innovative engineering research and education. The centers are comprised of a lead university plus partner institutions, and their work consists of up to 60 million dollars for up to 10 years. The centers have a Generation-4 now, which must have four foundational components listed here. For instance, the research has to be convergent, which means that the several disciplines work interdependently. There is also emphasis on engineering systems that have high societal impact, among several other requirements. As of today, more than 80% of our ERCs have been able to stay in our center after the 10-year period. This is a map of where the lead university of all of our ERC centers are located. The C2C mechanism enacts research collaborations between ERCs and global partners, to advance knowledge and benefit society across international boundaries by means of a supplement. Each country or jurisdiction funds their own participants.

Sandra Cruz-Pol:

There are many advantages brought out by international research engagement, as documented by scientific studies and reports. NSF believes that these types of collaborations are key in the development of innovative solutions to society's problems. The idea is to leverage facilities, expertise, and other resources to augment research and workforce development. We also look to enhance engagements within the industry, and train graduate students, or post-docs, among other advantages. The C2C mechanism was initiated in 2014 through a trilateral memorandum of understanding between the US, the Republic of Ireland, and Northern Ireland. It provided a mechanism for supplemental funding for active ERCs, to engage in the Irish Trilateral Collaboration. After several successful C2C collaborations, similar mechanisms have been put in place for countries beyond Ireland. As an example, this diagram presents the C2C model for Ireland. There's a single competitive peer-reviewed process, where the funding decisions are based on the NSF Merit Review criteria. The three-step process is delineated in the timeline shown here. It starts with a submission of a letter of expression of intent, 23 weeks before the NSF annual site visit to the particular ERC.

Sandra Cruz-Pol:

After internal evaluation from NSF and partners, the research crew might be declined, or invited to submit a C2C proposal. The second and third steps are to submit a draft, and then a full proposal, which is evaluated by a panel of experts at the C2C annual site visit. This is just a model, and each group of collaborating funding agencies would need to agree on a model that works for them. Here is a list of previous and current C2C projects, which is presented on the new portal, as shown in this screenshot. NSF funds up to \$800,000 for each C2C project. The budget allocated by other global partners varies. These images are from some of the awarded C2C projects. And as you can see, they cover a wide range of research topics, such as telecommunication, pharmaceuticals, nanomaterials, energy, and medical devices. More information can be found on the website of each of these ERCs. Now, I'll leave you with Rose Vieland from VentureWell, who will introduce you to the structure of the new portal.

Rose Vieland:

All right, thank you so much, Sandra.

Sandra Cruz-Pol:

Sure.

Rose Vieland:

And hello everyone, good morning or afternoon or evening, depending where you're calling in from. My name is Rose Vieland, and I am a program officer at VentureWell, a non-profit based in Massachusetts in the United States. ~~But f~~For over 20 years, [VentureWell](#) has been on a mission to cultivate a pipeline of innovators, inventors, and entrepreneurs driven to solve the world's greatest challenges, and to create lasting impact. We embarked on this particular project with NSF back in 2018, with the goal of increasing and enhancing the impacts of engineering research, by investigating the virtues of international collaborations, and attempting to unpack the greatest challenges, to increase the frequency and value of those collaborations. So we worked closely with the NSF ERC team, and stakeholders in the extended ERC community, to identify best practices, and deliver opportunities for collaborative learning and relationship-building between US and international research leaders and funding agency staff.

Rose Vieland:

We explored approaches to international collaboration through convenings of the US and international center level engineering research communities, science agencies, and relevant domain experts, including many of you here today. At two workshops held in August, 2018, and April, 2019, we discovered that one of the biggest needs for both the funding agency and ERC grantee communities was a centralized portal that you can all access regularly, to refer to to find international collaboration resources. So we built each of these resources to address specific challenges and opportunities raised by participants in the in-person workshops, and we're really thrilled that each of you are able to join us today to be the first group to get a peek at this portal. The portal will be accessible through the [erc-assoc.org](#) website, and is featured here in the top navigation bar. The International Collaboration Portal consists of three primary components, which we'll also refer to as resources. First is a rationale for international collaborations across each of the ERC's foundational components. This was written to help ERCs understand the potential added value of international collaborations, as they can contribute to an ERC's broader impact and intellectual merit, but can also be used by other stakeholders as a jumping off point into literature around international collaborations.

Rose Vieland:

Second, a database of international engineering research centers, and corresponding information of interest on those centers. Early iterations of this included some matchmaking functions, but for purposes of this pilot, the database can be thought of as a repository of potential collaborators, based on their research areas and other relevant information, which we will cover shortly. Hopefully in the future, we will be able to expand use of this to serve other types of research centers and topics, for which we'd be interested in your thoughts. Third, we have corresponding information on the international funding agencies that support these centers, as experience with piloting the C2C mechanism showed that collaboration must occur smoothly on both the researcher, and the funding agency level, to enable collaborations of highest impact. We're here to show what has been built so far within the portal, and it's still in the pilot stage, and not live yet, but we hope after integrating the feedback you give us here today, as well as in a short survey that's going to go around following this webinar, we'll be able to make additional improvements, and then make these resources available to you soon.

Rose Vieland:

This is what the home page of the portal will look like, and there are three buttons at the bottom of the page, which correspond to each of the three components. So, by clicking these buttons, you'll be able to navigate to the rationale, the database search, and the funding agency search. And I would also point out here, this link, to further information on the C2C mechanism in particular, which includes what Sandra presented to you this morning, and more information. I'm just going to take a minute here to explain why we chose these resources. First, the rationale. While it's generally held that international collaborations can contribute to the broader impacts of an intellectual merit of an ERC by adding economic, social, and intellectual value, there are a few evidence-based resources to help ERCs articulate that added value across the range of activities that they're funded to perform. And those are represented by the four foundational components. First, convergent research, to which we added team science, as we see these as strongly linked, and we wanted to add resources around strengthening science teams.

Rose Vieland:

Then, engineering workforce development, and diversity and culture of inclusion, which were the foci of our 2019 workshop, and also, innovation ecosystem activity. The rationale serves to highlight the benefits of international collaborations within the framework of these components, and our hope is that this format enables present and future grantees to more easily secure funding to support international collaborations. Here's a little peek at what the rationale page will look like, which includes hyperlinks to sources of interest. And you can navigate it all on one page by the four foundational components. The second and third buttons link to the International Research Center search, and the funding agency search. The reasoning behind the databases speak for themselves, and are probably why most of you are here today, to make potential collaborations more visible and accessible to all. Our method for collecting the information is roughly as follows. We started with outreach to approximately 100 funding bodies, in addition to web scraping.

Rose Vieland:

Through this outreach process, we collected information on international engineering centers these agencies and bodies fund. Including basic center and point of contact information, research topics explored at the center, facilities available through the center, including equipment and test beds, the primary language the center conducts their research in, partner organizations the center already collaborates with, and who funds the center. So the center records connect to the funding agency

records. As of today, there are 213 centers across 72 countries logged in the database, and we hope to have more added soon. We passed this information in a series of data transfers to our fabulous colleagues at CBS, hi John and Jim, they're on the call today, who manage the erc-assoc website. CBS created the portal, including the database and all other pages. And then build the portal in the Drupal content management system, on top of a MySQL database. Once it is live, we'll let everyone know, and you'll be able to fill in a form to provide additional information on your center or agency.

Rose Vieland:

So now the fun part, which will involve a little bit of my technical prowess. But I'll show you how to navigate through the new portal, and perform a few types of searches. So just going to share this preview. All right, so here's what the portal will look like when you first enter it on the erc-assoc website. I'm just going to go into the research center search, and I'll just show you what we have here for filters so far. This is a text search box, you can type in any word, and it will search the entire center record for that keyword. This is a language drop down menu for the primary language of the center. You can also search by region, if you are looking for funding that's related to a particular region. And some countries that you can filter by as well. So we'll do a little test. So let's say we're going to search for water, and then you'll get a list of all of the centers, we have a couple of pages of results here, that have water in their center record.

Rose Vieland:

Another feature is that you can search by multiple filters, so if we want to search in Mexico, you'll see these are the six centers in the database in Mexico that have water in their center record. And I'll show you what a center record looks like. On the right, you have a box that gives some at a glance information for the center, including a link to their website, some contact information for someone at the center, and a direct link to their funding agency record. Within this record, this varies depending on what has been available, but there are research areas, and some facilities and resources listed. And another thing I would point out, is there's a last modified date, so you can make sure that the information, especially this contact information, has been updated recently. So that's what the center search looks like. And also, if you want to completely start new, you can just press clear, and it will get rid of all of those filters for you.

Rose Vieland:

Now, I'm going to show you the funding agency search, which is the flip side of that center search. Here, you can search by region, and also a more exhaustive list of countries. So let's say United Kingdom, let's go to EPSRC, because we're talking about engineering. So it will give you a link to the main website for that funding agency or body, some general contact information, and here's a list of the centers associated with that funding body. So let's go into one of these, just to show you it links to the center record, and it shows you who it's funded by.

Rose Vieland:

So I hope that gives a bit of a glimpse of what the portal has so far.