DoSER

Dialogue on Science, Ethics, & Religion

Science for Seminaries

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AAAS

ADVANCING SCIENCE, SERVING SOCIETY

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2016 Science for Seminaries Advisory Committee meeting at AAAS headquarters

Introduction: Reaching Future Clergy

Science and technology influence nearly every aspect of modern life. Everything from our food supply to health care, from information transfer to the global environment, and from education to our basic understanding of who we are as human beings is shaped by modern science.

Many people look to their religious leaders for guidance on these important contemporary issues relating to science and technology. And yet clergy members often have had little exposure to science in their education and training.

Thus the Science for Seminaries program, long recommended by American Association for the Advancement of Science (AAAS) advisors and the Association of Theological Schools (ATS), aims to equip religious leaders with solid scientific exposure that is relevant to their future congregations and ministries.

Here we report the activities and findings from the pilot Science for Seminaries project, in which several theological training institutions introduced scientific content in practical ways into their core educational programs.

Through strategic engagement with leaders in theological education and future religious leaders-in-training, Science for Seminaries anticipates a positive impact not only on seminary education, but on the broader American public. It is our hope and vision that the enthusiasm expressed by participants in the program will be carried into the future congregations of seminary students, establishing a vibrant atmosphere conducive to informed discussions and contemplation of scientific advancement and its impact on life, knowledge, and service in today's world.

Jennifer Wiseman, Director
AAAS Dialogue on Science, Ethics, and Religion (DoSER)

"Because religious leaders have unique cultural voices and influence in American society, the Science for Seminaries project advances AAAS' mission to "Advance Science and Serve Society" by providing opportunities for these future leaders to engage with scientists and be exposed to forefront scientific discoveries."

– Rush D. Holt, AAAS CEO

Program Development

Although the idea for a science and seminaries project emerged more than 15 years ago, the first major steps began in 2010 and involved nearly two years of thoughtful, strategic planning by AAAS and the Association of Theological Schools (ATS). Science in theological education was of particular importance to ATS leadership, because an integral part of the organization's mission is to adequately prepare future leaders to be culturally relevant on issues faced by modern congregations. Therefore, this project would need to include the development of effective pedagogical strategies and catalysts for institutional commitment.

In partnership with ATS, AAAS hosted a number of planning meetings in 2011 with key seminary faculty and administrators from a diversity of religious traditions. Those meetings assessed interest and examined challenges in and opportunities for developing a program of science engagement in seminaries.

They included a symposium at the 2011 AAAS Annual Meeting, a session at the Chief Academic Officers Society (CAOS) annual meeting co-organized by ATS, a two-part event at the Annual Meeting of the American Academy of Religion and Society of Biblical Literature (AAR/SBL), and a workshop at AAAS for the faculty of Washington Theological Consortium Schools. While there was consensus in these gatherings about the value of a science for seminaries effort, the investigative meetings uncovered key obstacles, especially in regard to faculty recruitment.

First, seminary faculty are already overextended in their teaching loads. Asking them to create yet another course would be an insurmountable burden. Second, in light of these demands, gaining the interest of both faculty and administrators who were not already invested in the science and religion arena would be a challenge. Third, efforts to recruit a diversity of seminaries meant recognizing that different approaches would be required to address the unique perspectives of different institutions and religious traditions. Another commonly cited challenge was the unfamiliarity of seminary faculty with forefront science topics.

Various ideas were considered and critically evaluated for feasibility. Activities such as scientists in residence at seminaries were deemed financially unsustainable. It was also recognized that separate optional science-based courses would not reach most students. Ultimately, AAAS and its partners decided that the most effective route would be to support the integration of science into the core seminary experience while leaving implementation strategies to the individual seminaries.

Many institutions already offered elective "science and religion" courses, which typically appeal to a small subset of their student bodies. Bringing science into the center of theological education and into core curricula would address

Curriculum Meeting at Jesuit School of Theology of Santa Clara University

some of the identified challenges and could have a broader impact.

Through required courses, all students would gain some science exposure during their seminary experience. The science engagement in core courses would communicate to seminarians both the importance of scientific awareness and the relevance of scientific findings for their future ministry vocations.

Integrating science into already established curricula would alleviate pressure on faculty to create additional courses. The approach would also generate science modules that could easily be shared with the broader seminary community. Lastly, an integrative approach would give institutions ownership of their programs while respecting their differing needs across a spectrum of religious traditions.

Pilot Project Launch

With a vision in place, AAAS recruited and relied upon the expertise of an advisory committee that consisted of scientists and seminary faculty and administrators with extensive experience or scholarship engaging in scientific topics (see advisory list on inside front cover). The scientist members were also actively engaged in public and religious community outreach. The insights of both groups proved beneficial for AAAS throughout the variety of events and products of the three-year project.

Next, in partnership with ATS, AAAS offered a pilot grant opportunity for seminaries interested in integrating science into their core theological curricula. Ten grants of up to $200,000 each—depending on the scale of the proposed project—were offered through the ATS network of affiliated seminaries and divinity schools.

The institutions were asked to propose the revision of at least two core courses and plan at least one campus-wide activity during a three-year grant period that would explore the relevance of science to theological education. The goal was to create proven scientific resources for theological institutions, including science-integrated course syllabi that could be used as stand-alone modules or adapted by other seminaries in the future.

For the grant recipients, AAAS offered two primary means of support that were most recommended in the exploratory meetings. First, AAAS would be the portal through which scientific resources, including both topical materials and connections to scientists, could be accessed. Second, AAAS would provide a network of like-minded seminary faculty vested in bringing science into their institutions. Through these mechanisms, pilot project participants would have the opportunity to develop important relationships with other science-focused theological educators and with local scientists, such that those relationships would go on to foster sustainable infrastructure at the grant seminaries.

AAAS received 28 Letters of Interest (LOIs) in early 2014 from institutions throughout the United States and Canada, representing three Christian ecclesial families with historically different theological perspectives as defined by ATS — Catholic/Orthodox, Mainline Protestant, and Conservative/ Evangelical Protestant. The response far exceeded expectations and demonstrated that the Christian theological community recognizes the impact of scientific advancement on pastoral practice.

In consultation with the executive leadership at ATS, 15 seminaries

ATS Endorsement

"It was appealing to ATS to work with AAAS/DoSER because they bring to the project the highest levels of credibility and expertise in science. ATS is able to bring credibility from the theology side because it represents faculty with outstanding theological expertise from theological schools that have achieved credibility through the rigorous processes of accreditation.

Part of the project has been to nurture fruitful conversations between scientists and theologians. We want theologians to have a better understanding of science. We also want scientists to have a better understanding of theology. Through the conversation the project has helped to clarify the kinds of questions each is equipped to answer."

– Stephen R. Graham, Senior Director of Programs and Services, The Association of Theological Schools

"The campus-wide survey revealed both an openness toward science and an interesting gap between our community's attitudes about the compatibility of theology and science and that of the wider world. Our students appear motivated to try to close that gap!"

–Andover Newton Theological Seminary Project Faculty

were invited to submit full proposals. Submissions were evaluated for their articulation of the following criteria: creativity, substantial but realistic engagement with science (in both core curriculum and campus enrichment activities) and the experience and accomplishments of project faculty.

Additionally, institutional commitment to cultural engagement and potential for sustainability and broad impact beyond the funded seminary community to churches, ministries, other seminaries and beyond the length of project were considered.

Pilot seminaries were required to propose fresh content and not merely maintain a status quo of pre-established science engagement. Faculty from each institution were asked to propose at least two revisions to ATS-defined core course areas—systematic theology, biblical studies, church history, and pastoral theology—while additional ideas could be proposed for popular elective courses.

The proposal review panel consisted of a diverse group of scientists and seminary faculty. Reviewers considered the robustness of each seminary's commitment to cultural engagement and its ability to commit administrative and institutional support to complete project goals and activities.

Grants for winning seminaries covered faculty time on the project, along with activities and resources that helped bring science into the seminary community through campus-wide events, student essay competitions, guest scientist lectures, etc. Applicants submitted grant budgets according to the scale of their proposed projects. These were evaluated for cost-effectiveness, relevance, and direct investment in the primary goals of the project.

The final 10 grant seminaries were selected in consultation with AAAS and ATS by the external review committee. Funded seminaries began planning and implementing revised curricula in the 2014-2015 school year. Other new courses and additional revisions have now been implemented into second and third years, into the spring of 2017.

Pilot Project Schools

- Andover Newton Theological School –Newton Centre, Massachusetts
- Catholic University of America – Washington, DC
- Columbia Theological Seminary – Decatur, Georgia
- Concordia Seminary of the Lutheran Church Missouri Synod – St. Louis, Missouri
- Howard University School of Divinity – Washington, DC
- Jesuit School of Theology of Santa Clara University – Berkeley, California
- Lutheran Theological Seminary at Gettysburg – Gettysburg, Pennsylvania
- Multnomah Biblical Seminary –Portland, Oregon
- Regent University School of Divinity – Virginia Beach, Virginia
- Wake Forest University School of Divinity – Winston-Salem, North Carolina

Denominational Diversity

According to the 2014 U.S. Religious Landscape Study conducted by Pew Research Center, approximately 71% of the U.S. population identifies itself as Christian. In 2013, AAAS and sociologists at Rice University conducted a joint nationwide survey which found that some Christians (particularly evangelicals) are more likely than members of other religious traditions to consult a religious leader or fellow congregant about a scientific question.

In light of these findings, this project's main goal was to equip future religious leaders with a solid scientific foundation from which to answer questions and build constructive dialogue on science with their congregations.

AAAS partnered with ATS, a membership organization of graduate schools that confer professional and academic degrees for the practice of ministry and theology. ATS's Commission on Accrediting certifies these seminaries and divinity schools, organizing the member schools of Christian denominations into three ecclesial families, on which AAAS based its pilot project organization. The pilot seminaries were organized as follows:

- Catholic/Orthodox: Catholic University of America and Jesuit School of Theology of Santa Clara University
- Evangelical /Conservative Protestant: Concordia Seminary, Multnomah Biblical Seminary, and Regent University School of Divinity
- Mainline Protestant: Andover Newton Theological Seminary, Columbia Theological Seminary, Howard University School of Divinity, Lutheran Theological Seminary at Gettysburg, and Wake Forest University School of Divinity.

By working with this diverse group of seminaries, representing three major Christian ecclesial families, the project made contact with a large percentage of the Christian denominations. This strategy allowed the project to fulfill its goal of enriching future religious leaders from across a broad spectrum of U.S. congregations.

Attendees at the 2015 American Academy of Religion Science for Seminaries symposium

AAAS Support

As part of its contribution to the grantee institutions, AAAS helped to recruit a curriculum planning team for each seminary (some of whom were drawn from the project advisory committee). Project faculty were connected with two theological professors unaffiliated with their institution and two scientists who served as mentors and advisors. These scholars and scientists were matched with the project seminaries according to their expertise and the schools' proposed science topics.

The theological mentors represented a diverse range of disciplines, including systematic theology, biblical studies, pastoral theology, and church history. Each of the scholars had significant experience in connecting science to their fields of expertise, and was committed to providing peer support to their matched project faculty throughout the life of the project.

The scientists were researchers or professors from nearby institutions, and they played a critical role in highlighting forefront science topics that were relevant to the seminary projects and related societal interests. They assisted the project faculty in curricula planning and course implementation, bringing a breadth of knowledge in astrophysics, cosmology, genomics, genetics, paleontology, chemistry, neuroscience, biology, and other scientific disciplines. They were also able to help pilot project faculty locate and identify supplemental science resources.

A prime example of a successful partnership is Concordia Seminary of the Lutheran Church–Missouri Synod and science advisor S. Joshua Swamidass, assistant professor of laboratory and genomic medicine at Washington University in Saint Louis.

"Many religious leaders are eager to learn about science. They warmly welcome the scientists who respectfully engage their beliefs, traditions and questions with thoughtful conversation," said Swamidass. Further, he and Concordia Seminary faculty "have found substantial common ground, and real opportunities to work together for the common good."

While AAAS matched two science advisors per seminary, several of the schools also utilized new and continuing partnerships with scientist colleagues within their own or nearby institutions, often inviting scientists as guest lecturers into their classrooms.

Curriculum DevelopmentMeetings

Throughout 2014-2015, AAAS representatives visited project faculty, mentors, and science advisors at each seminary campus for curriculum planning meetings. The purpose of these gatherings was to share ideas and resources for the implementation of the project. The seminaries were encouraged to continue to sharpen their modified courses through ongoing meetings with their advisory teams.

In summer 2015, AAAS hosted a two-day meeting at AAAS headquarters that brought together faculty and dean representatives from all 10 seminaries with DoSER project advisory committee and several scientist advisors and seminary faculty mentors.

Project leaders met one another for the first time and provided overviews of their projects to the attendees. Participants discussed the successes and challenges

Summer 2015 curriculum meeting

of science integration at their own institutions. They shared ideas on how to draw from one another's achievements to enhance the success of their own.

They advised AAAS on what topics might best be addressed by a series of short films that AAAS produced for use in seminary classrooms. AAAS has continued to assist the pilot seminaries by recommending science resources and connecting project faculty with scientists to engage their seminary communities.

Course Revisions

The accomplishments of the project seminaries continue to greatly exceed expectations. Instead of the expected 20 course revisions, to date more than 116 courses have been touched by this grant through the 10 pilot seminaries.

The most common science topics integrated by the seminaries into the four ATS-defined core course areas include neuroscience, cosmology/astronomy, and evolution. Several courses deal with obvious points of contact between science and theology: For example, church history courses about understanding biblical texts on creation in light of the key findings in evolution and cosmology, and systematic theology courses on considering ethics and morality in the context of neuroscience and psychology.

Some classes were modified or created to deal more directly with pastoral issues in light of contemporary scientific fields. Many of these courses were uniquely shaped to fit their respective religious traditions.

Catholic University of America's Foundations of Liturgy and Sacrament course found insightful ways to incorporate topics like learning and memory and the perception of senses by exploring the effects of communal worship and music on the brain. And the Spiritual Formation Foundations course at Regent University School of Divinity integrated topics of health and medicine through case studies of "the unhealthy pastor."

The Lutheran Theological Seminary at Gettysburg expanded on its Pastoral Theology of Cancer course, adding reflections on pastoral and theological considerations in light of the evolutionary principles guiding cancer formation and progression.

Pope Francis' environmental encyclical, *Laudato Si'*, was published in May 2015 during the project's first year, inspiring many seminaries to address ecology and environmental sciences in unique ways.

At Howard University School of Divinity, an Introduction to Hebrew Bible course integrated paleoclimatology to offer some historical context. Similarly, a class at Jesuit School of Theology at Santa Clara explores the significance of resource management and agricultural sciences in Old Testament texts, and challenges students to consider its contemporary implications for the theology of ecological stewardship.

Several institutions covered the philosophy and history of science in the context of church history, encouraging seminarians to foster improved science/religion dialogue within their communities.

> "The divinity school has reconnected with its history and gained a renewed appreciation for collaboration with colleagues across the university in fulfillment of the university's mission, especially in addressing matters related to healthcare in minority populations."
>
> – Frederick L. Ware, Associate Professor of Theology, Howard University School of Divinity

Conversation built relationships

Additional courses integrated more specialized topics in technology, such as limits and frontiers of space exploration, synthetic biology and artificial intelligence.

Enrichment Activities

The broad exposure of seminarians to science through this project offered diverse opportunities for students to engage with scientific advances both within and outside the classroom setting. In addition to major campus-wide events, faculty brought science directly to their students through field trips to museums and research labs, scientist guest lectures, supplemental readings, science book clubs, film screenings, research paper assignments and more.

For example, at Wake Forest School of Divinity, students dissected sheep brains during a visit to a neuroscience laboratory at Wake Forest University as part of a Neuroethics course. Andover Newton Theological Seminary's course, Topics in Jewish, Christian and Muslim Relations, utilized a series of science videos on neurobiology and brain plasticity to spark discussion about building impactful interreligious leadership.

Students of Wake Forest Divinity School's course, God and the Cosmos, visited the Kennedy Space Center, while Columbia Theological Seminary students visited the Georgia Aquarium as part of an Old Testament interpretations course to better reflect on the biodiversity of life and creation.

These opportunities immersed the seminarians in the relevant science while simultaneously enriching their theological training, and were therefore often warmly referred to as "pilgrimage" experiences by the project faculty.

As one Columbia Seminary student said about the aquarium field trip experience, "[The science exposure] really enhances my pastoral care with those asking at the end of life, 'Why are we all here?' and 'What was it all about, anyway?'... Faith and some scientific knowledge have made me feel not apart from the world but a part of God's universe."

Scientists, especially the local science advisors, were frequently invited as guest lecturers to speak about their areas of expertise. Columbia Theological Seminary hosted several guest lectures featuring astrophysicist Chris De Pree, professor and chair of astronomy at Agnes Scott College. De Pree lectured on cosmology and star formation in an Old Testament course.

Gregg Davidson, professor and chair of the geology and geological engineering departments at the University of Mississippi, was invited to speak at Multnomah Biblical Seminary. Davidson lectured on geology in Reformation and post-Reformation Theology course that focused on the book of Genesis.

The number of campus-wide events that took place through the project is another significant indicator of its success. Instead of the anticipated 10 campus-wide events, the partner seminaries have held at least 77 events to date. These events have ranged from conferences that attracted hundreds of attendees to smaller gatherings that focused on specific science topics.

Several seminaries held screenings of science fiction films like "Interstellar," "Ender's Game" and "The Martian" to spark conversations and contemplation on the implications of space travel and settlement. At Catholic University of America, a seminarian-led lunch

discussion focused on the theological implications of finding extraterrestrials.

Book clubs were a means of seamlessly fostering science appreciation among students and faculty. For example, a Concordia Seminary book club read "Minds, Brains, Souls and Gods" by Malcolm Jeeves to generate interest and dialogue on science.

Reflecting on the book club, project leader and professor of systematic theology Joel Okamoto said, "The campus-wide book club has gotten students, faculty, staff and spouses reading and talking about what neuroscience says about brains and minds and what this might mean for theology and pastoral ministry." He concluded, "The project has had an impact throughout the seminary community."

Major campus lectures included different formats and interests, ranging from multi-day conferences to lecture series. For instance, Multnomah Biblical Seminary hosted a two-week church and science conference. The event presented an overview of the science and religion relationship, featuring scientists and theological scholars to promote cross-community dialogue.

Columbia Theological Seminary brought prominent scientists like AAAS board member Claire M. Fraser, director of the Institute for Genome Sciences at the University of Maryland, School of Medicine, to speak on the science of the human microbiome. Andover Newton Theological Seminary's capstone event was a one-day science symposium covering the neurobiology of pain and the psychology of healing.

These strategic campus-wide events reinforced many of the topics highlighted in the classes and students' receptions to them were overwhelmingly positive. Drawing from campus-wide surveys that the AAAS asked all seminaries to administer as a means to evaluate the project, a strong majority reported positive views of science and saw science as relevant to their studies and future ministries.

The range of student attitudes was strikingly similar from seminary to seminary, regardless of denomination

> "One of the things that has been essential to me is learning that science/faith doesn't have to be either/or...it can be both/and. Each can inform the other and add to one another's experience."
>
> –Concordia Theological Seminary Student

Retreat participants found the natural environment in Oregon (right) and Maine conducive to discussion

"The relationships with scientists that the project has enabled have been surprising, enlightening, and rewarding- and for them as much as for us."

–Joel Okamoto, professor of systematic theology, Concordia Seminary

or ecclesial family. A student at the Jesuit School of Theology at Santa Clara felt "well-armed to engage [in] some questions on the relationship between religion and science" as a result of the project.

A small minority of students expressed the opinion that science does not have a place in their education or their lives. Taken together, the courses and enrichment activities offered seminarians a deeper exploration of their own theology, enhanced by the wonder of the natural world that can be uncovered through the latest scientific discoveries.

Faculty Enrichment Retreats

A culminating event of the project was a series of three faculty enrichment retreats held in summer 2016 that showcased the work of each pilot seminary. The goal of the retreat series was to offer a new cohort of seminary faculty a unique opportunity to gather ideas about how to enrich theological education with forefront science and how to integrate it into their own curriculum design.

Organized as intimate workshops with other seminary faculty and scientists, the retreats combined plenary presentations, field trips and small-group discussions to bring Science for Seminaries to the broader seminary community.

A call for applications from seminary faculty was made through the ATS network for these retreats. AAAS received 137 applications to fill 37 participant slots. The applicants hailed from 105 seminaries in the ATS network. Evenly divided among ecclesial families, the applicants represented approximately 38% of the ATS member schools. This high level of interest is a testament to the perceived need and the enthusiasm of the broader theological education community for interdisciplinary engagement with science.

The four-day retreats, organized by ecclesial family, were held in Newagen, Maine, and Timberline, Oregon. Attendees were chosen from among the applicants by an external selection committee consisting of the project advisors, in consultation with AAAS and ATS. Successful applicants were invited to attend the retreat offered for their institutional ecclesial family.

Science: The Wide Angle

Seminaries are bringing world-class science into their classrooms with a compelling new short film series from AAAS. Topics include:

- Awe & Wonder: Scientists Reflect on Their Vocations
- Have Science and Religion Always Been at War? The Draper-White Thesis
- Space and Exploration: Humans in a Vast Universe
- Biological Evolution and the Kinship of All Life
- To Be Human
- Is the Human Mind Predisposed to Religious Thought?
- Frontiers of Neuroscience: Charting the Complexity of Our Brains
- How Science Works
- The Limits of Science

Retreat sessions covered pedagogical approaches to integrating key science topics. In addition to the most popular natural scientific fields of astronomy, evolution, and neuroscience, the sessions also included ways to incorporate social science topics like psychology in wellness and health and contemporary sociological issues of gender and racial justice. Attendees also learned from keynote sessions on new developments in science.

After attending the Catholic retreat in Newagen, Maine, Dominic Doyle (associate professor of systematic theology at Boston College School of Theology and Ministry) said it was "very well-designed to foster meaningful interaction between seminary teachers and scientists, with ample opportunity for one-on-one and group discussions." He anticipated that the experience and resources he was offered through the retreat would "[make] the job of integrating science into the core seminary curriculum much easier and less daunting."

Curriculum development sessions proved one of the most appreciated elements of the retreats. These informal meetings gave incoming faculty participants a structured but casual opportunity to have consultations with project faculty, mentors, and science advisors about pedagogy, specific science topics, available resources and more.

"The Science for Seminaries retreat was a very rich experience. It was well-thought-out, giving us stimulating ideas, useful lists of resources, and enough time to begin to process what we were learning. I was impressed by the significant investment that was made in the individual award recipients, including one-on-one consultations on our plans for teaching," said participant Anne T. Thayer (professor of church history at Lancaster Theological Seminary).

Steven M. Studebaker (associate professor of systematic and historical theology and chair in evangelical thought at McMaster Divinity College) said that colleagues at the retreat "provided effective strategies for navigating the challenge of addressing issues related to science for non-specialist seminary professors."

Highlighting the pedagogical potential of science enrichment activities, the retreats included field trips to Bigelow Laboratory for Ocean Sciences and the Coastal Maine Botanical Gardens, and a stargazing tour and nature walk guided by a park ranger on the façade of Mt. Hood in Oregon.

Retreat participants representing all three ecclesial families said they appreciated the opportunity to build or renew relationships with theology colleagues and scientists. Beth A. Rath (assistant professor of philosophy at Borromeo Seminary) said, "AAAS has provided me with a network of project partners and scientists with whom I can consult." James Higginbotham (associate professor of pastoral care and counseling at Earlham School of Religion) added, "The journey ahead for incorporating more natural science in my classes will be stimulating."

Advisor Perspective

"One of the great successes of the project has been the development of life-giving relationships between the people who do the work of teaching in the Science for Seminaries project. Nurturing faculty-to-faculty connections has proven to be an effective approach for building sustainable groups committed to exploring the intersections of religion and science for the future. "

–Lea F. Schweitz, associate professor of systematic theology/religion & science, director of the Zygon Center for Religion and Science, Lutheran School of Theology at Chicago

Science Resources for Seminaries

To ensure that pilot seminaries would have easy access to cutting-edge science resources, AAAS has provided them with multi-year journal subscriptions to *Science* and *Scientific American*. Ongoing print subscriptions are being offered to all project seminaries, and site licenses are provided to institutions without prior access. Project faculty report having used the journals for their own educational enrichment; more importantly, they have strategically placed these resources in student and faculty lounges to encourage visibility and conversations on science.

Additional resources created throughout the course of the project are hosted on the project website at scienceforseminaries.org. Key among these resources is "Science: The Wide Angle," a series of high-quality short films that present exciting scientific advances, but that are tailored to spark discussion in a seminary classroom (see sidebar on page 10 for a list of titles). Featuring some of the world's leading scientists and historians of science, this series presents science topics in an engaging way.

Each film introduces the science while leaving room for faculty to guide classroom discussion of societal implications and theological touch-points. To assist them, AAAS has collaborated with an academic advisor to craft study guides that introduce the scientist participants, expand the topical context, and provide additional resources to broaden discussion. These resources are archived with the accompanying films at scienceforseminaries.org.

The site also hosts course syllabi from the project seminaries that were revised to engage with science content. Tagged and organized by categories such as course area, ecclesial family and science topic, this collection demonstrates the range of approaches pilot faculty implemented and the wide range of topics they found to be enriched with science. For future seminary faculty interested in following suit, these downloadable syllabi provide a superb starting point.

Next Steps

The Science for Seminaries project continues to uncover a substantial interest and urgent need felt by theological educators for ways to engage science in the seminary community. In addition to the high interest level found in the student and faculty populations, many scientists continue to enthusiastically give their time and support to this project.

In light of these successful metrics of impact and interest, AAAS is eager to continue building upon the groundwork of this project. First, AAAS is working on a complementary approach to providing science enrichment to religious leaders who are already serving communities.

Many of these pastors and clergy seek continuing education opportunities provided by seminaries after their traditional degree programs. AAAS will continue to work with theological institutions to offer science enrichment to practicing clergy, providing opportunities for them to learn more about scientific topics and the relevance and value of science for their ministries and the congregations they serve.

Second, reaching beyond the wide range of Christian traditions, AAAS DoSER is working with Jewish seminaries to integrate science into their training of rabbis, cantors and other Jewish leaders.

Based on the structure of Science for Seminaries, AAAS is supporting two Jewish institutions, Hebrew College and Hebrew Union College-Jewish Institute of Religion, which will each host an intensive course on science for future rabbis and cantors, along with a series of science-themed webinars for a network of practicing rabbis.

Many of the resources that were developed for the Science for Seminaries project may be relevant and helpful for communities within other religious traditions, and even nonreligious communities.

Finally, the impact of the Science for Seminaries project demonstrates the potential for seminaries to engage with the scientific community, and vice versa, at a grass-roots level, regardless of grant support.

For example, retreat participant Dominic Doyle has set up a reading group on theology and science that involves collaboration with university colleagues outside his institution. "These discussions are providing me with informed conversation on important areas of my new syllabi," said Doyle.

The resources and networks created by AAAS will continue to be made available to seminaries interested in science. Through these means, they will find ideas and diverse approaches to connect with local scientists, foster inter-

departmental or inter-institutional conversations, and take key steps towards bringing science topics into their classrooms.

As AAAS DoSER's work consistently demonstrates, both scientists and religious communities are enthusiastic about dialogue, and meaningful interactions remain critical to dismantling false perceptions and reframing the national discourse toward a greater public appreciation of science. For the scientific community, Science for Seminaries has represented a rich opportunity to advance science by fostering key partnerships and building an infrastructure that has the potential to make long-lasting societal impacts.

Faculty Enrichment Retreat participants hike Mt. Hood, Oregon

"Often people think that science and religion, if not actually contrary, are at least orthogonal and irrelevant to each other in society. The Science for Seminaries project of AAAS is premised on the realization that science and technology can both inform, and be influenced by, the broader societal questions engaged by religious communities including ethics, meaning, service, and beauty. Religious leaders called to seminary can benefit from that understanding, as will their congregations, and so can practicing scientists."

–Rush D. Holt, AAAS CEO

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ABOUT AAAS | DOSER

The American Association for the Advancement of Science (AAAS) seeks to advance science, engineering, and innovation throughout the world for the benefit of all people. AAAS established the Dialogue on Science, Ethics, and Religion (DoSER) program in 1995 to facilitate communication and understanding between scientific and religious communities. For more information about AAAS, visit AAAS.org. For more information about the Science for Seminaries project, visit scienceforseminaries.org/.

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