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Timothy Law Snyder

*Loyola Marymount University, President, timothy.snyder@lmu.edu*

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## Necessary Companions: Faith and Reason

Timothy Law Snyder  
President  
Loyola Marymount University  
[timothy.snyder@lmu.edu](mailto:timothy.snyder@lmu.edu)

### Abstract

Can faith and reason exist, free of mutual companionship? If we restrict ourselves to a traditional scientific method when pondering questions of the universe and close the door to theological data and human thought, we may be rendering inaccessible the majority of what exists. As a scientist, I take solace in what we can discover through science and math as we seek to understand the one percent of our physical universe that is accessible. But humans seek to know more, to learn more, to experience more. In this essay, I argue that the synthesis of faith and reason helps us to experience what can be known—in ways that neither faith nor reason alone can. As a Catholic university with a Jesuit and Marymount heritage, Loyola Marymount University (LMU) integrates faith and reason into our core curriculum for many reasons. We speak often about wanting our students to develop as whole persons, to lead lives with and for others, to be educated toward purpose. We also educate them to explore the universe with an open mind and to pursue truth with all their being. Such a pursuit requires *fides et ratio*, necessary companions that shepherd us in and toward infinite wonder.

### Prologue: I Wonder

*Infinite wonder* is a gift from God, one that we are ceaselessly compelled to honor.

As a mathematician, this gift allows me to see beauty in numbers and abstractions of structures associated with them. I am energized by queries, speculations, hypotheses, answers, proofs, and problems—particularly ones that I might solve.

As a musician, I hear beauty in rhythm, tonal coloration, notes, and harmony—some of which can be symbolized, very much like mathematical entities. I see the music on a page and I want to play it. It comes to life, but it is different every time.

When I write my own music, I look within to create. The pieces arrive from *somewhere*. The challenge of creation is mine—as composer, arranger, mixer, producer, and masterer—to breathe life into musical tones. My desire to discover within myself, through and *within* the music—to be creative—is incessant, immutable.

I am not alone. As the trailblazing physicist David Bohm put it, “The artist, the musical composer, the architect, the scientist all feel a fundamental need to discover and create something new that is

whole and total, harmonious and beautiful.”<sup>1</sup>

Research mathematics is not unlike the creation of music. It requires one to noodle around to determine what features, yet to be *heard*, exist in our universe. It requires one to rehearse and practice so that various techniques are at the ready as the creative process begins to flow. It requires one to reach into the unknown and see something, imagine something, and synthesize something yet to be witnessed. Songs we have not yet composed; books we have not yet written; art that has yet to be conceived; universes we have yet to know; unknown parts of the universe that are evolving with us, changing rapidly—all ask that we take part, that we contribute. This is where our imagination erupts. And this is also where faith plays a prominent and necessary role.

### Desire to Know: Science and the Scientific Method

Our human subjectivity endows us with a desire to know in ways fair and definitive. “Being truthful means being faithful to the desire to know.”<sup>2</sup> Indeed, this desire to know is a defining characteristic of humans



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McGrath & Reilly,  
*LMU President's  
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Collection:  
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*President's  
Institute on the  
Catholic  
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LMU: A Twenty-  
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*Nurturing Student  
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Jarvis, *Faith  
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Rohm, *Our  
Students' Search  
for Meaning*

Scheibler, *What  
Can TV Teach Us  
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*Faith and Reason  
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and, moreover, desire to know is a boundless property of our history's brilliant scientists.

When I experience infinite wonder and the joy that accompanies discovery and the pursuit of truth, physics Nobel Laureate Richard Feynman comes to mind. Anyone who has seen a clip from his 1983 "Fun to Imagine" series has been inspired by Feynman's unbridled desire to know, to break things down, and to attempt to explain the mysteries of the universe using science.<sup>3</sup>

Science provides us with valuable tools to ask probing questions, investigate them, find solutions, make corrections, then recycle a given pursuit into a new round of inquiry that seeks to improve what we have learned. This is how science continues to unfold and reveal more mystery and more wonder. But as citizens of this glorious universe, we have a duty to view the world in which we live with what John Haught calls critical intelligence: our experience, understanding, judgments, and decisions—our subjectivity. Critical intelligence, Haught claims, is something for which science cannot account.<sup>4</sup> His argument is that, although science seeks and claims to be objective, it carries an *a priori* rejection of theological experience.<sup>5</sup> Our challenge here is the "*a priori*": we are compelled to ask how classic scientific methodology is able to make such a distinction—that is, what facet or essence of theological observational or experienced data renders it "unable to play"?

Epistemologically, such exclusion is a dangerous step: A truly objective mind should view theological experience as valid, legitimate, "legal" data. Viewed through Haught's lens, we can conclude that theology and science, even though different in approach, await greater harvest. Furthermore, if we want to experience more, understand more, and therefore contribute more to our rapidly changing universe, we must explore syntheses of faith and reason.

This brings me back to Feynman. In *The Meaning of It All*, Feynman's book composed of three lectures from 1963, he advocates in "The Uncertainty of Science" that we be open to the unknown within science, saying that doubts are of paramount value: "All scientific knowledge is uncertain. This experience with doubt and

uncertainty is important. I believe that to solve any problem that has never been solved before, you have to leave the door to the unknown ajar. You have to permit the possibility that you do not have it exactly right. Otherwise, if you have made up your mind already, you might not solve it."<sup>6</sup>

For a scientist to leave the door of the unknown ajar but simultaneously slam the door to faith and its data is an odd, even arbitrary strategy. In spirit, doing so is contrary to Feynman's sentiment. Although Feynman was speaking to science within the boundaries of the scientific method, one can quickly "Haughtize" his advocacy to extend to the theological experience—and the mystery of faith.

### Desire to Know: Companionship

Following Feynman's advice, as expanded through Haught, the surest way to knowing is to open ourselves up to all—all reasonable, all faithful—all available data and all available experience. Our traditional science, based in scientific method, has successfully helped us explore and seek infinite wonder—and satisfy our personal wonder—*out there*, that is, to the far reaches of the cosmos and to the innermost reaches within the matter and processes of our universe. But, despite its reach at scales large and small, traditional science has painted itself into an evidentiary box. We would be wiser to lift science's self-imposed sanctions.

Ian Barbour describes four historical stages concerning the relationship between religion and science. The first three—conflict, independence, and dialogue—do not rely on a poetic coalescence. But the fourth stage—one at which most current scholarship on religion and science dwells—synthesizes religion and science.<sup>7</sup> Such a synthesis is perhaps best exemplified by Pierre Teilhard de Chardin, S.J. Teilhard unraveled and rewove our understanding of the universe, and especially our place within it. As a scientist he looked toward data-based evidence, but he also presupposed a cosmic purpose. For Teilhard, religion and science are "two conjugated faces or phases of one and the same complete act of knowledge—the only one which can embrace the past and future of evolution so as to contemplate, measure and fulfill them."<sup>8</sup> Teilhard's ultimate configuration is ambitious: It includes all of us, all of creation, and all of the Creator. We are already

part of a cosmic treatise in which we ultimately converge to a cosmic consciousness: when God will be all in all. In his work, Teilhard starts by using all things knowable and all things experienced—that is, *all data available*, including that from the spiritual. Second, he sees us as an integral part of the evolution of the universe. We are not objective observers who are privileged to be apart from consequential participation.

### **Inflationary Cosmology and the Necessity of Infinite Wonder/Infinite Faith**

In his scheme, Teilhard in no way releases us from our responsibility. No matter what our available resources, the acts of creativity, the contemplation, nuance, and invention are still on us. This is at once alarming and freeing. But these emotional responses expand further when we consider *inflationary cosmology*. Inflationary cosmology tells us that the early universe, in the first trillionth of a second of its existence, expanded at a rate far greater than the rate that followed, including that which we witness and measure today. Because the universe expanded so rapidly following the Big Bang, space itself expanded at a rate that outpaced the speed of light.<sup>9</sup> This theory leads us to a critical observation, and one that, to my surprise, is rarely noted: The vast majority of what exists in our universe has already moved beyond what can ever be reached, for we would require measurements or observations that would need to travel faster than the speed of light in order to catch up to places where the majority of the universe exists. *This means that the majority of what exists will never be accessible to us, hence cannot be known. Ever.*

Debates about the origins of the universe are nothing new, but, recently, controversy concerning the scientific validity of inflationary cosmology has taken an interesting turn. Scientists—within science—are having a drag-down argument over what comprises legitimate data and legitimate theory. The basic argument is over whether what seems verifiable on paper, using mathematical and other analytical techniques, is considered factual when one has no capacity to measure it. Some argue that because we can never test for the truth of inflationary cosmology, it cannot be considered as legitimate science. Others argue that the methods that have

configured the theory are sufficient (and some are now arguing that verifiability through testing may be possible, anyway). We see here a classic reason versus faith struggle taking place inside the boundaries of the usually epistemologically unified scientific community.<sup>10</sup>

Thus inflationary cosmology, if true, tells us that the universe is set up so that the majority of what exists can never be known, at least by us. Regardless of our theory or approach, we are limited to only part of reality's data—and a startlingly small part of it at that. Where does this leave us? Given such inherent humble straits of a universal denial, we should be inspired to turn from our traditional epistemologies to those that are as inclusive as possible, those that open us to all available data. Simply stated, we need to use all we can get our hands on. And that demands that we turn our attention from science's traditional *out there* to the *in here*—admitting our theological experience and findings.

Andrei Linde, one of the originators of inflationary cosmology, asks, “Is it not possible that consciousness, like space-time, has its own intrinsic degrees of freedom, and that neglecting these will lead to a description of the universe that is fundamentally incomplete?”<sup>11</sup> Linde argues that this and similar questions about consciousness are requisite for working in the field of quantum cosmology. Here, even Linde is calling for a melting of the borders that encapsulate traditional science.

A freedom of thought that allows for us to be open to the infinite possibilities suffuses theoretical physicist Brian Greene's writing. Whether he's discussing the elegance of the universe or hidden realities, his wonder for all of it, especially that which cannot be proven, inspires me to no end. Quantum physics requires faith; string theory requires faith; parallel existing universes require faith. The faith might be in science, but it is still a leap into the boundless universe that we must take if we want to know more. All this is to say, if we limit ourselves to the scientific method and close the door to data that are available within ourselves, within the profundity of our consciousness and experience, we will render further inaccessible the majority of what exists.

## **Horse and Carriage: Faith Needs Science, Too**

I've talked much about science needing faith, but the inverse is also true. Faith must recognize the findings of science if it is to remain appropriately contextualized to the universal realities in which we live. In the endeavor to achieve companionship with its counterpart, the faith world—at least the Catholic Church—has made more progress than its complementary community of scientists. Catholicism has a rich and influential intellectual tradition. Thinking as far back as St. Augustine and St. Aquinas, science was revered as a necessary method leading to understanding our existence.

Although Catholic doctrine has not traditionally been at odds with the theory of evolution, with Pope Francis we have an unparalleled advocate for the union of religion and science: “The Big Bang theory does not contradict the intervention of a Divine Creator but depends on it. Evolution in nature does not conflict with the notion of Creation, because evolution presupposes the creation of beings who evolve.”<sup>12</sup> Pope Francis' commitment to science, while upholding the core values of the Catholic tradition, has energized and inspired institutions and individuals across the globe. So faith, at least as exemplified by the Catholic Church, seems to be increasingly adapted for synthesis with science.

## **Integrations, Inclusivity, and Imagination**

LMU integrates faith and reason into our core curriculum for many reasons. As a Catholic university with Jesuit and Marymount heritages, we speak often to wanting our students to develop as whole persons, to lead lives for and with others, to be educated toward purpose. But we also, and often without recognizing so, seek to educate students to explore the universe with an open mind and to pursue truth with all their being. We prepare them for the future—to be a part of the malleable conversation, to shape the conversation, and to change the world. I am proud that the courses and programs we offer ignite dialogue between theology and other fields that inform and enrich the pursuit of questions about ultimate concerns. We view interdisciplinarity as a means

to discovery and wonder, and our integrations—faith and reason; ethics and justice; and interdisciplinary connections (all part of Loyola Marymount University's core curriculum) demonstrate our unwavering commitment to engaging in purposeful, open discourse.

Beyond our core curriculum, the integration of faith and reason through environmental justice awareness is vital to the work of Nicole Bouvier-Brown, Ph.D., assistant professor of chemistry. In her course assignments, she requires students to read articles and discuss the social implications of environmental chemistry; she also asks students to use real air quality data to reach their own conclusions about the patterns of exposure to air pollution. Students learn from their research that burdens of air pollution are not equally shared among all people. Engaging in the experience of discovery by the students exploring data trends builds intellectual and emotional connections to an environmental justice issue, which can potentially lead to community action. This stewardship of God's creation and the companion charge to alleviate the suffering of the poor fuse more than theological teachings with science: They also encourage the service of faith and the pursuit of justice, which co-exist as the third platform of LMU's mission.

Our community of scholars works in dialogue with the Catholic intellectual tradition by developing, critically examining, communicating, and engaging the vast resources of Catholic thought and imagination. The interdisciplinarity that we foster at LMU is championed by our Academy of Catholic Thought and Imagination. The academy interweaves scholarship, interdisciplinary research, innovative pedagogy, and creative outreach across our campus and beyond. With Professor Brian Treanor at the helm, ACTI presents bold programs like *Mystery, Imagination, and the Catholic University*, an exhibition of religious tools and emblems representing the mysteries of faith—as well as early examples of exploration and scientific discovery that consider the wonders of life on Earth. The academy calls on our community to think broadly while challenging our assumptions and cultivating our curiosity.

For its inaugural event, ACTI hosted Vatican astronomer Brother Guy Consolmagno, S.J., whose lecture *Science, Religion and Storytelling* illuminated why stories are crucial to our understanding of religion.<sup>13</sup> It also explained why being a good storyteller is essential in science, and how the way we tell these stories influences the way we think about the big ideas. Speaking to how science fiction changed his life, Brother Consolmagno closed his talk with a statement aligned with ACTI's vision: "Seeing worlds that might be teaches me to be more aware of the worlds that actually are."<sup>14</sup> All of our ACTI programs, by representing the intersection of faith and reason, enlighten us in entertaining and thought-provoking ways, asking us to be open to the unknown while engaging in the here and now.

## Conclusion

As we consider the meaning of being a Catholic university amidst recent papal calls for reconciliation, we experience faith and reason as necessary companions: relative to one another but also integral to the divine quest for reconciliation. The whole requires them to be united and present—as we are with each other, with God, and with creation and our desire to create. Let us always remember that the sublime reveals itself to us every day in the heavens above; in the microcosms below the threshold of our vision; and here, within and between ourselves. Anticipating what our imaginations may create in the world of tomorrow, I am invigorated and propelled to action by embracing *fides et ratio*, our necessary companions, ushering us to infinite wonder. HJE

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## Notes

<sup>1</sup> David Bohm, *On Creativity* (New York: Routledge, 1996), 3.

<sup>2</sup> John F. Haught, *Is Nature Enough?: Meaning and Truth in the Age of Science* (New York: Cambridge University Press, 2006), 40.

<sup>3</sup> "Fun to Imagine," BBC Archives, accessed September 29, 2017, <http://www.bbc.co.uk/archive/feynman/>.

<sup>4</sup> Haught, *Is Nature Enough?*, 28.

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<sup>5</sup> Technically, Haught speaks to "naturalist science," which he carefully defines. For our purposes here, the use of "science" suffices.

<sup>6</sup> Richard P. Feynman, *The Meaning of It All: Thoughts of a Citizen Scientist* (Reading, Mass: Perseus Books, 1998), 27.

<sup>7</sup> Ian G. Barbour, *When Science Meets Religion* (San Francisco: Harper, 2000), 7-38.

<sup>8</sup> Pierre Teilhard de Chardin, *The Phenomenon of Man* (New York: Harper, 2008), 285.

<sup>9</sup> We are accustomed to be aware that no object in the universe can travel faster than the speed of light, which is the case, but the universe—space itself—is under no such restriction.

<sup>10</sup> String theory has generated a similar debate.

<sup>11</sup> Andrei Linde, "Inflationary Cosmology and the Question of Teleology," in *Science and Religion in Search of Cosmic Purpose*, ed. John F. Haught (Washington: Georgetown University Press, 2000), 15

<sup>12</sup> Pope Pius XII's 1950 encyclical affirmed that there was no conflict between evolution and Catholic faith. In 1996, Pope John Paul II reaffirmed this, emphasizing that evolution was more than a hypothesis; Francis, "Address of His Holiness Pope Francis on the Occasion of the Inauguration of the Bust in Honor of Pope Benedict XVI," October 27, 2014, accessed September 29, 2017, [https://w2.vatican.va/content/francesco/en/speeches/2014/october/documents/papa-francesco\\_20141027\\_plenaria-accademia-scienze.html](https://w2.vatican.va/content/francesco/en/speeches/2014/october/documents/papa-francesco_20141027_plenaria-accademia-scienze.html).

<sup>13</sup> Jesuit brother Guy Consolmagno, S.J. was the first clergyman awarded the Carl Sagan Medal for Excellence in Public Communication in Planetary Science for his "outstanding communication by an active planetary scientist to the general public."

<sup>14</sup> Academy of Catholic Thought and Imagination, "Science, Religion and Storytelling with Br. Guy Consolmagno, S.J.," filmed March 2011, YouTube video, 1:30:00, posted June 2016, [https://www.youtube.com/watch?time\\_continue=1226&v=BNyLpHvgH2E](https://www.youtube.com/watch?time_continue=1226&v=BNyLpHvgH2E).