

# Put out into the deep: Finding faith in the depths of the Universe, perspectives on the relationship between faith and physics

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## ABSTRACT

Often portrayed as archrivals, physicists and theologians have much in common. Physicists and theologians are both embarked on a quest which is the pursuit of truth. Relations have at times been strained, often due to a lack of understanding of the ‘other’. In this paper we search out meeting points between physics and faith in order to promote respectful dialogue and understanding between the two, whilst recognising the distinct areas of expertise of the two disciplines.

## 1 FAITH AND THE PHYSICIST

People are often a bit surprised when they find out that I am an astrophysicist who believes in God. In conversations reminiscent of the exchange depicted in ‘Through the looking glass’ in which the White Queen suggests to Alice that if one tries hard enough it is possible to believe ‘as many as six impossible things before breakfast’ (2), I find that people often think that to believe in God and the laws of physics must be a near impossible task, and I am often asked how it is possible to believe in both. This paper is the fruit of a talk that I gave addressing this very question. This paper does not present an argument for or against the existence of God, it is simply the personal reflections of the lived reality of one who believes in God, who also believes in the underlying physical laws of the Universe. I write from the Christian perspective, but I hope that these thoughts on the nature of belief and the relationship between belief in the natural and belief in the supernatural are helpful to people of all faiths and none.

## 2 THE NATURE OF REALITY

### 2.1 The spiritual and the physical realms

When you look at the sunset, what do you see? The poet will speak of romance and beauty, the physicist could tell you the exact wavelength of the sun’s rays as they are refracted by Earth’s atmosphere, and precisely what conditions are necessary to observe the green flash. Both describe the same reality, but they address different questions. In order to have a dialogue about the relationship between faith and physics, it is necessary to categorise

reality and identify the differences between the physical and the spiritual. The physical realm concerns all that is visible, observable, measurable, natural; this is the realm addressed by the natural sciences. The spiritual realm concerns all that is above nature, i.e. the supernatural; these things are described by faith and theology. For questions related to the physical world, physics has the answer, or aspires to have the answer, for example questions such as: How old is the Universe? What is it made from? How big is it? But there are other important questions which physics does not attempt to answer, for example Who am I? What brings me joy? What is the purpose and meaning of my life?

Recognising that there are different realms of reality, the physical and the spiritual, and recognising that the different realms each have their own perspectives on reality, their own specialist language and their own expertise can assist in disentangling perceived conflict between faith and physics. This recognition can help to provide the correct tools and framework for promoting dialogue between the two.

### 2.2 Areas of competence in science and theology

The discipline of physics and the discipline of theology treat different but complimentary subject areas. Theology deals with matters of faith and the supernatural world, physics deals with the physical, observable, natural world. A problem that often arises is when physics extends itself beyond the boundaries of its sphere of competence to comment on matters of faith, or equally problematic, the reverse when theology attempts to use its knowledge to comment on truths about the natural phys-

ical world. When Christians (and many other believers) speak about God, they refer to an all powerful being who is pure spirit, who is not physical, hence it does not make sense to try and prove or disprove the existence of God by searching for physical evidence or using the observational techniques of modern physics. Pope John Paul II stated that ‘to desire a scientific proof of God would be equivalent to lowering God to the level of the beings of our world... Science must recognise its limits and its inability to reach the existence of God: it can neither affirm nor deny his existence’ (5). Physics can neither prove nor disprove the existence of God, who is pure spirit and is not part of the physical universe.

### 2.3 Distorted portrayals of religious belief

Another obstacle to dialogue is the mistaken idea that religious belief is the result of lack of scientific explanation about some aspect the natural world. This is the so called ‘God of the gaps’ caricature of religious belief that is so easily set up and subsequently overthrown by those who wish to discredit religious faith. For example a non-believer may posit the argument that ‘people only believe in God because they do not understand the scientific explanation for the beginning of the Universe’. The portrayal is such that as soon as the believer comes to a scientific awakening, they will no longer need to have recourse to religious beliefs to fill in the ‘gaps’ in their scientific knowledge. Stephen Hawking sets up this ‘God of the gaps’ idea in his book in ‘The Grand Design’ in which he explains that ‘it is not necessary to invoke God to light the blue touch paper and set the universe going’ (4).

This ‘God of the gaps’ portrayal is a parody of true faith of a believer. The Christian tradition sees the natural and supernatural existing alongside each other, being complimentary, interrelated but distinct. Pope John Paul II remarks that ‘religion is not founded on science nor is science an extension of religion... Christianity possesses the source of its justification within itself and does not expect science to constitute its primary apologetic.’(6). True religious belief is not a result of failure to understand science. Devising arguments to discredit a ‘God of the gaps’ portrayal of faith is a distraction from the main discussion on the relationship between science and religion.

## 3 MEETING POINTS OF FAITH AND PHYSICS

Once we recognise that science and religion deal with different, complimentary aspects of the same reality, and recognise that they seek to answer different questions, we can begin to search for meeting points between the two approaches. Two meeting points I should like to highlight are the pursuit of truth and the sense of wonder that points us beyond ourselves.

### 3.1 Why do astronomers study the Universe?

One justification for devoting time and resources to the study of the Universe is that a better understanding of the laws of physics eventually results in advances in technology that can improve the quality of life of Earth’s citizens. This is certainly true and there have been many developments in computing and technology that can be attributed directly or indirectly to the study of the Universe and its laws, however this is likely not the most efficient way of improving household technology or the outputs of the manufacturing sectors. Although these advances in technology are advantageous, they are not the primary driver for the exploration of the Cosmos. The primary driver of research into astronomy, cosmology and fundamental physics is human curiosity, the quest for knowledge and the desire of humankind to know what lies beyond itself.

New Worlds, New Horizons is the National Academies’ 2010 Decadal Review in Astrophysics, which sets out the science goals of astrophysics and cosmology, also makes mention of some of these more human reasons for studying the Universe. In its introductory chapters, New Worlds New Horizons explains some of the motivations for astrophysics research:

*The Universe has always beckoned us. Over the course of human civilisation, the night sky has provided a calendar for the farmer, a guide for the sailor, and a home for the gods. Astronomy led the scientific revolution, which continues to this day and has revealed that the sky visible to the naked eye is really just a hint of a vast and complex cosmos, within which our home planet is but a pale blue dot. Astronomers continue to explore the universe, learning its amazing history, discovering the richness of its contents, and understanding the physical processes that take place in its astoundingly diverse environments. Today, astronomy expands knowledge and understanding, inspiring new generations to ask, How did the universe form and the stars first come into being? Is there life beyond Earth? What natural forces control our universal destiny? Because of the remarkable scientific progress in recent decades, in particular the explosion over the last decade of interest in and urgency to understand several key areas in astronomy and astrophysics, scientists are now poised to address these and many other equally profound questions in substantive ways. . . . The opportunities for the future fill us with awe, enrich our culture, and frame our view of the human condition.*

The ideas in this extract which are especially pertinent to the dialogue between faith and physics are that the Universe beckons us, it calls us; the Universe is something beautiful, intriguing, there is some deep mystery that speaks to us; the Cosmos is vast and complex, worthy of exploration. Our physical place in the Universe is very small and humble, ‘our home planet is but a pale blue dot’ in someone else’s sky. Who’s sky? Astronomy asks deep and profound questions about the the history and nature of the Universe. Crucially, the exploration of

the Universe ‘fills us with awe, it enriches our culture and frames our view on the human condition.’

### 3.2 Profound questions about the Universe

Contemplating these ideas and profound questions about the Universe prompts man to ask deep and searching questions about his origins, his identity, his significance in the cosmos. Does our identity change if we find intelligent life on other planets? What does it mean to be human? These stirrings of the heart may give rise to a sense of awe and wonder in the face of the sheer magnificence and scale of the Universe. In these stirrings of the heart man is already experiencing some sense of natural transcendence, some dim awareness that the Universe which lies outside is vastly greater than he can ever comprehend. These questions may find partial answers in purely natural explanations, these experiences of awe and wonder may be treasured and stored away, perhaps to be taken out and reflected on from time to time.

This is the point at which natural contemplation of the physical Universe can reach out and make an appeal to man’s spiritual side. This is not to say that a sense of awe at the Universe in anyway proves the existence of God, we have already established that physics can neither prove nor disprove the existence of a supernatural being. The point here is rather more subtle: contemplation of man’s place in the Universe can cause him to look deep within his heart and ask himself searching questions: Who am I? Why am I here? What is the purpose of my life? Is the physical reality around me all that there is, or is there something more? Does life have a meaning? Is there more to life than meets the eye? Some people will dismiss these questions, others will search for answers elsewhere, but for some people, these questions will act as a doorway to the divine and a bridge to the spiritual life. Here, physics has reached out to make an overture to faith. How faith replies to this overture will be the subject of section 5.

## 4 CONTEMPLATION AND THE PURSUIT OF TRUTH

Physicists and theologians are both embarked on a quest which is the pursuit of truth. Physicists are using observations and mathematical models to pursue the truth about the natural world, theologians are using faith, reason and revelation to pursue the truth about God. Although pursuing different questions, this search for truth and this belief that truth exists and can be found is common to both disciplines. This desire to look beyond and seek out the truth belongs to the dignity of man and is something which raises man up above the other animals.

Pursuit of truth generally involves study, reflection, deep thought and intellectual inquiry, in a word, it requires contemplation. Contemplation is the term often used by spiritual writers to describe the mind’s activity

when considering God and thinking about truths pertaining to the Creator. However, the action of contemplation can be applied to the study of any truth, not just the truth about God. Thomas Aquinas, one of the greatest theologians from Medieval times, tells us that ‘those human considerations that are directed to the pursuit of truth belong to the contemplative life’ (1). There is a contemplative dimension to the pursuit of truth in any academic discipline, in astrophysics, the truth that we seek is the truth about the Universe.

Astrophysics is about looking directly at the Universe, but it is also about thinking deeply about the Universe, contemplating the Universe and seeking to understand how it works. New Worlds New Horizons points out that ‘many of the most far reaching and revolutionary discoveries in astronomy sprang from the imagination of inspired theorists thinking in deep and original ways about how to understand the data, and making testable predictions about new ideas’ (3). The ideas and questions described in New Worlds, New Horizons are wonderful and profound questions that speak of understanding our Cosmic Origins, the Cosmic Dawn, searching for the first stars, galaxies and black holes, searching for new worlds, seeking out nearby habitable planets, understanding the cosmic order. This really means looking for the underlying physical laws that govern our Universe ‘One of the biggest challenges in the next decade is to understand how the basic building blocks of matter and energy, governed by known physical laws, are responsible for the dazzling array of astrophysical phenomena that intrigue and inspire us.’ (3)

Contemplation of the Universe and the intellectual pursuit of truth about the natural world, is in itself a worthy human endeavour. The Christian tradition recognises the importance of contemplation of the natural world as being meritorious in its own right. The scientist who devotes his life to the advancement of human knowledge about the cosmos is doing good work, regardless of whatever religious belief he may or may not have. Without detracting from the worthy pursuit of scientific knowledge, the Christian tradition also recognises that there is a higher truth to be sought out, which is the truth about God. This is not a question of pursuing either scientific or religious truth, this is about recognising that both are important and complimentary. From the Christian perspective, the study of the Universe, although good in its own right, truly finds its highest meaning and fulfilment when it is seen within the context of understanding Creation in relation to its Creator.

## 5 FAITH’S RESPONSE THE STUDY OF THE PHYSICAL WORLD

What does it mean to say that the study of the natural world finds its highest meaning in the context of the divine? It does not mean that scientific endeavour needs religious belief to answer its unanswered questions of physics, but it does mean that there is more to the human condition than the purely physical, and there is

more to life than what meets the eye. We know that humans need food, warmth and shelter in order to survive, but we also know that to live well, even on the purely natural level, humans also need relationships, family, friends, purpose, meaning, work and recreation in their lives. From the Christian perspective, there is also another need beyond this, which is knowledge of the divine. In section 3.1 we spoke of how contemplation of the Universe can prompt man to look beyond himself and ask deep questions about the meaning and purpose of life. In this section we will describe the Christian response to those yearnings to 'look beyond'.

### 5.1 From the visible to the invisible

There has been a longtime understanding in the Abrahamic religions that knowledge of the Universe can lead to knowledge of God. Augustine of Hippo, a 3rd century bishop, theologian and philosopher from North Africa is among many who have considered this question. Augustine asks us to 'see how far reason can advance from visible to invisible things in its ascent from temporal to eternal things.' Augustine tells us that 'we should not vainly behold the beauty of the sky, the order of the stars, the brightness of light ... in these things there should be no exercise of vain and perishing curiosity, but a step should be taken towards immortal things that abide forever' (7). The idea here is that knowledge of Creation, which is seen, can point us towards knowledge of the Creator who is unseen and invisible. There is something important here, that the contemplation of the Universe can elevate our hearts and minds to a sense of wonder, a sense of transcendence, and it can lead us to contemplate the Creator. The Universe is distinct from God, but it was made by God. The Universe has not existed forever, it was created at a finite point in time, but the idea of the Universe has existed in infinite detail in the eternal mind of God since all eternity. Surely the Universe, which is a product of the mind of God, somehow reflects and points towards the nature of God? Every tree, every leaf, every forest, every flower, every mountain, every lake, every star, every bird, every fish, every planet, every galaxy, every person, indeed every created thing somehow reflects the glory of God. Everything that is created comes from the infinite, eternal mind of God and is somehow imprinted with the mark of the Creator.

There are many passages in Judaeo Christian scriptures that explain the idea that we can come to know the Creator by meditating on the Created world. In his letter to the people of Rome, Paul, an important first century Christian says that 'ever since the creation of the world, the invisible existence of God and his everlasting power have been clearly seen by the mind's understanding of created things.' (Rom.1:20), that is, the intellect apprehends the nature of the Created Universe and ascends to knowledge of God. This idea is stated even more strongly in the book of Wisdom, which says rather bluntly that 'naturally stupid are all who are unaware of God, and who, from good things seen, have not

been able to discover Him-who-is, or, by studying the works, have not recognised the Artificer. Fire, however, or wind, or the swift air, the sphere of the stars, impetuous water, heaven's lamps, are what they have held to be the gods who govern the world. If, charmed by their beauty, they have taken these for gods, let them know how much the Master of these excels them, since He was the very source of beauty that created them. And if they have been impressed by their power and energy, let them deduce from these how much mightier is he that has formed them, since through the grandeur and beauty of the creatures we may, by analogy, contemplate their Author.' (Wis. 13:15). When the book of Sirach describes how God made humans, the author explains that God gave humans a special light to recognise the works of God that would inspire them to praise God. Sirach says that when God made humans 'He filled them with knowledge and intelligence, and showed them what was good and what evil. He put his own light in their hearts to show them the magnificence of his works, so that they would praise his holy name as they told of his magnificent works.' (Sir. 17:7-8). Paul and the book of Wisdom tell us that we can come to know God through contemplation of Creation, Sirach goes a step further and tells us that this recognition of God shown forth in his creation should evoke in us a response of praise of God.

## 6 SEEING IS BELIEVING?

Why do people believe in God? It is rarely because they have seen God, but more often it is because they have experienced something which has prompted them to look beyond themselves. A point that we have laboured in this paper is that the existence of God cannot be proven by physical observations. This was true even for the close friends of God, the disciples of Jesus. Christians believe that two thousand years ago God took on human nature and entered his Creation in the person of Jesus Christ. Jesus was both fully human and fully divine, born as a baby as the Christmas story tells us, he grew up and looked like any other man.

There are many stories of Jesus performing miracles in the New Testament writings, but it is interesting to note that the miracles, whilst being truly miraculous are in general not dramatic and overwhelming in a manner which would force a person to believe incontrovertibly that Jesus is God, or even that God exists. Many people encountered Jesus, witnessed his miracles, thought him a good man, but did not believe that Jesus was God. But there were some people who encountered Jesus who recognised in him something that caused them to look beyond the merely physical and recognise the presence of God. Whatever one's personal beliefs about who Jesus really is, it is instructive to look at the encounters between Jesus and his disciples as models of religious belief.

### 6.1 Put out into the deep

There is an account early in the Gospel of Luke which describes a seemingly unremarkable encounter between Jesus and a few fishermen. Jesus borrows a fishing boat from Simon in order that he might use it as a platform from which to address the people. Afterwards, when he has finished, Jesus tells Simon and his brother Andrew to ‘put out into the deep and let down your nets for a catch’ (Lk. 5:4). Simon protested since it was the wrong time of day for catching fish, but the fishermen complied. To their great surprise, they caught a huge haul of fish. This seems to be a fairly minor miracle, catching a lot of fish at the wrong time of day. But to Simon, this encounter was everything, he saw beyond and recognised the presence of God. Simon fell down before Jesus and said ‘depart from me, for I am a sinful man, O Lord’ (Lk.5:8). With these words, Simon recognises two things: he recognises the presence and power of God manifested in a very subtle way and he also recognises his own littleness in the presence of something, someone, much greater than himself. This encounter has such a profound effect on Simon and Andrew that they leave everything to follow Jesus.

This account (which is one among many similar accounts) has parallels with the experience of a person who gazes into the night sky, who sees the beauty of creation, who witnesses the miracle of the Universe and recognises the power of God manifested in a very subtle way, and likewise recognises his own littleness in the presence of something much greater than himself. When we look into the depths of the Universe and ‘put out into the deep’, we can be humbled when we are confronted by the beauty and the scale of the miracle of Creation, that can evoke in us that same response of Simon, that recognition of the goodness and greatness of the Divine Creator who is Lord of all, and the smallness of one’s self in relation to the Creator.

### 7 FINAL REFLECTIONS

In this paper we have sought to give some perspectives on the relationship between physics and faith. We have taken care to distinguish the physical from the spiritual, to recognise that there are different questions which are important, some to do with the purely physical, others to do with the supernatural. We have been at pains to recognise the different areas of competence of science and religion. Recognising these distinct areas of expertise can assist in prompting respectful dialogue and understanding between the two fields.

This paper has sought to identify some of the common themes and ideals pursued by both scientists and theologians, most notably the idea that the search for and contemplation of truth, be it truth about the natural world, or truth about God is a worthy and important human endeavour. The other key idea is that contemplation of Creation can prompt man to look deep into his heart where he encounters some of the deepest and most

profound questions of human existence. Thinking about these profound questions can cause man to experience a natural transcendence, which can open in him a doorway to the divine.

We hope that this brief reflection on one perspective of the relationship between faith and physics provides a way of categorising the different perspectives on the Universe and the different human responses that contemplation of the Universe can evoke, which we hope will help promote respectful dialogue between faith and physics.

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The complex but enduring relationship between the sciences and diverse world religions has now transformed itself into what some are calling a new scholarly field of science and religion. In the last two decades public awareness of and interest in this complex and often contentious relationship between science and religion has reached an unprecedented level. All religious traditions and all forms of scientific work have something to gain as well as lose in the process of mutual interaction, and the historical record demonstrates profound and longstanding engagement between science and religion — Put out into deep water! There is great meaning to this little line. First of all, it's important to note that the Apostles had fished all night long with no success. They were most likely disappointed at their lack of fish and were not all that ready to fish some more. But Jesus directs Simon to do so and he does it. The result is that they caught more fish than they thought they could handle. But the one piece of symbolic meaning we should not miss is that Jesus tells Simon to put out into the "deep" water. What does that mean? "Lord, I desire to put out into the deep water and to radically evangelize in the way to which You call me. Help me to say "Yes" to you in all things. Jesus, I trust in You." The Solemnity of Jesus Christ, King of the Universe. The Truth Wins! Purification. Love—the basis of the Christian faith—puts death, faith, and the "course of human things" into proper perspective for Tennyson. Whether mankind was here on earth for several thousand years or several million, the foundational principles of Christianity, Tennyson suggests, do not change based on scientific theories and observations. From Tennyson's perspective, complying with a set of religious prescriptions and stirring up emotional responses that deceive people into believing they are pleasing God are not sound-minded principles that yield a faith that can weather any storm. Tennyson did not give into disbelief although it could have been an easy thing to do under the circumstances in his life. Dunn believes these "works of the law" functioned as "boundary markers" between Jews and Gentiles.<sup>14</sup> This means Paul was fighting Jewish prejudice and anti-Gentile bigotry; not a supposed merit theology or moralistic legalism embedded in Second Temple Judaism.

**BRIEF CONSIDERATIONS ON THE APPEALS OF THE NEW PERSPECTIVE** This last consideration especially is part of the appeal of the New Perspective on Paul: it seeks to heal some of the rifts not only between Rome and Geneva but also between Germany and Jerusalem (in a manner of speaking). Faith is seen as the new and better identity badge of those who are in the people of God — not as Paul's confessional formulation against the "dark backdrop" of Jewish legalism. Put Out Into The Deep. 2 undoubtedly be his legacy. Surely, this Polish Pope has exceeded all expectations, even the expectations of those who prophesied over twenty three years ago that he would be the one to bring the Church into the Third Millennium. 4 and recovering our roots, the depths, the expanse that is rightly the life of faith in the Son of God, Jesus Christ and His Body the Church. This going back in order to move forward reminded the Holy Father of the words of Jesus to Peter and his companions on the shore of the Sea of Galilee. Put Out Into The Deep. 5 To purify our vision for the contemplation of the mystery, this Jubilee Year has been strongly marked by the request for forgiveness.