

# Professor Allan Sandage—his research led to Intelligent Design

Jerry Bergman

Allan Sandage was a widely published astronomer who went from an atheist to a creationist and Christian. The question of origins was a concern he researched for much of his career. In a number of interviews he detailed the reasons for his conversion, and a major one was his study of science. He is only one of many who have found the evidence of an intelligent creator compelling, forcing him to learn about this creator and eventually converting to Christianity.

Allan Rex Sandage (18 June 1926 – 13 November 2010) was one of the most influential astronomers of the last century. He is also regarded as “the greatest observational cosmologist in the world”, a man “who has deciphered the secrets of the stars, plumbed the mysteries of quasars, revealed the age of globular clusters, pinpointed the distances of remote galaxies, and quantified the universe’s expansion through his work at the Mount Wilson and Palomar observatories.”<sup>1</sup>

## His background

Sandage was reared in an academic atmosphere. His parents were connected with some university for the entire time that he lived at home.<sup>2</sup> Sandage graduated from the University of Illinois in physics and earned his Ph.D. from the California Institute of Technology under observational astronomer Dr Walter Baade.<sup>3</sup>

As a graduate student he was an assistant to the famed cosmologist Edwin Hubble. Sandage continued Hubble’s research program after Hubble’s sudden death and discovered “substantial errors in Hubble’s figures”.<sup>4</sup> In 1958, Sandage published the first good estimate for the Hubble constant, revising Hubble’s value of 250 Km/s/Mpc down to as low as 50 Km/s/Mpc, which is close to today’s accepted value. He also found Hubble made many errors in his research, such as mistaking bright gaseous nebulae in galaxies for giant stars.<sup>5</sup>

A prolific researcher with over 500 papers to his credit, Sandage continued to be an active researcher until his death.<sup>6</sup> He has influenced observational cosmology for at least the last four decades by careful observational research performed with a large telescope. His work enabled him to publish two galaxy atlases, one in 1961, the second in 1981, based on his Hubble research. He also co-wrote the seminal paper first theorizing the structure of the Milky Way Galaxy (see figure 1), and is noted for the discovery of jets erupting from the M82 galaxy (see figure 2), concluding that these eruptions were caused by massive explosions in the galaxy’s core.

His “seminal work was his 1961 paper ‘The ability of the 200-inch telescope to discriminate between selected world models’, which has become the basis of modern observational cosmology.”<sup>6</sup> Strobel added that very few

“... scientists are as widely respected as this one-time protégé to legendary astronomer Edwin Hubble. Sandage has been showered with prestigious honors from the American Astronomical Society, the Swiss Physical Society, the Royal Astronomical Society, and the Swedish Academy of Sciences, receiving astronomy’s equivalent of the Nobel Prize. The *New York Times* dubbed him the ‘Grand Old Man of Cosmology’.”<sup>1</sup>

Sandage’s obituary in *Nature* said,

“Sandage was one of the most prolific and influential astronomers of the second half of the twentieth century. Edwin Hubble and Walter Baade both left their scientific papers to him, and he continued the work of these two giants with spectacular results.”<sup>6</sup>

Sandage’s “devotion to carrying on Hubble’s life work” caused him to work in isolation much like Hubble did, partly as a result of “the envy of colleagues over the publicity Sandage received”.<sup>7</sup> He eventually became the first scientist that

“... the newspaper reporters called with big questions about how the universe is structured. In part it resulted from his almost religious intensity, his refusal to act like one of the boys, his insistence that what he was doing was every bit as important as it appeared, a quality that earned him the nickname ‘Super-Hubble.’ And in part it resulted from specialization; Sandage became very nearly the only person on Earth fully versed in observational cosmology.”<sup>7</sup>

Jesse Greenstein said that much of Sandage’s research

“... he has been doing for so long that for anybody else just to catch up would take years. And nobody would consider retracing his work anyway, because he is viewed as a man of absolute integrity. I don’t know any other field in the world where you can say that of somebody, that he has absolute integrity.”<sup>8</sup>

An honest man, he wrote “most predictions of the future in books such as *The Next 100 Years* <sup>9</sup> ... are out of date in a time that is usually 10% of the time to their goal.”<sup>10</sup>

He also wrote that “although imagination alone cannot build the road to objective knowledge,” it can point

“... in the right direction. Indeed, we believe that imagination provides the elusive opening with which to break the hermeneutical circle. Imagination, or genius, or intuition, lets the classification *start* so that the successive iterations, back and forth between the empirical and the rational, hone the product until it eventually conforms to nature. Only then is the dross of the classifier skimmed away and a true order in nature ... revealed.”<sup>11</sup>

*Nature* noted that in mid-career Sandage “became deeply concerned about the meaning of life. He studied the Bible and spoke in public about science and religion as ‘two separate closets in the same house’.”<sup>6</sup>

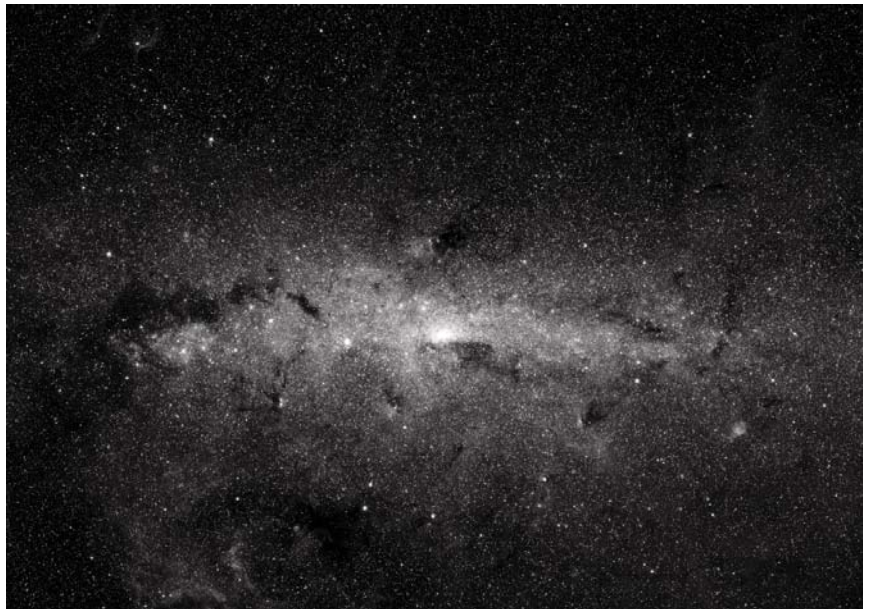
### He rejects atheism

The “ethnically Jewish Sandage had been a virtual atheist even as a child.”<sup>11</sup> Many assumed that “a scientist of his stature must surely be skeptical about God” after his lifetime of work in science because “the more deeply scientists see into the secrets of the universe, you’d expect, the more God would fade away from their hearts and minds.”<sup>12</sup> After a lifetime of research he realized that the answer to the origins of life and the universe is

“... outside the practice of science. This does not mean that science itself cannot drive one’s faith in the realm of human experience. (The mysterious, delicate inter-connections of the co-operative phenomena of a living organism, for example, seem to me to be incapable of arising without a blueprint. How does a mighty oak develop from a tiny acorn? This is what I mean by ‘science driving faith.’) I only mean that there is more to the human view of the world than is contained within the majesty of the cold but exquisite equations of mathematical physics.”<sup>13</sup>

He added that in some ways science also remains mysterious even after 300 years of scientific research. Examples he gave include questions such as:

“Why does mathematics so effectively describe the world? Why does Newtonian gravity, which depends upon the mysterious, even absurd notion of action at a distance, enable us to send satellites to the moon? ... The miracle of Maxwell’s equations from which come electromagnetism, light, radio waves, and communication over large distances with no contact ‘forces,’ is an even greater mystery. And finally, modern science gives us the strange, counterintuitive world of quantum mechanics. As



Photograph courtesy of NASA

**Figure 1.** A photograph of the Milky Way Galaxy, the home of our solar system, taken using infrared photography. Astronomers determine information such as the distance of these objects from the earth and each other, and the motions of each using techniques such as spectral analysis to understand the structure and function of these stellar objects.

Niels Bohr said, ‘Whoever says they understand quantum mechanics does not understand quantum mechanics.’”<sup>13</sup>

One reason science remains mysterious is that humans have “imposed a system on the world called laws” that they believe give us some understanding of how the world works, but actually

“... there is no *real* understanding. Why do differential equations describe the world? No one understands how the world knows to work like that, but it does. What is action-at-a-distance in Newtonian gravity? Or what is the curvature of space in Einstein’s alternate description of the gravitational force? One mystery has been traded for another, and yet we still do not understand [emphasis added].”<sup>14</sup>

Sandage concluded that modern physics is mystical, giving examples such as “its virtual states, nonempty vacuums” and the belief that the universe was “created by a random fluctuation out of nothing”.<sup>14</sup> The result is that “modern physics has become nonscientific in terms of what we would have considered scientific a hundred years ago.”<sup>14</sup>

### Sandage becomes a theist and a Christian

As a result of his science he became a theist and, eventually, a Christian. His obituary in *The Telegraph* (London) noted that “he became a born again Christian, reasoning that ‘I could not live a life full of cynicism. I chose to believe, and a peace of mind came over me.’”<sup>15</sup> His conversion surprised many scientists and non-scientists alike. At one scientific meeting of atheists and theists, who sat across from each other in separate areas,

“Sandage set the room abuzz by turning and taking a chair among the theists. Even more dazzling, in the context of a talk about the Big Bang and its philosophical implications, he disclosed publicly that he had decided to become a Christian at age fifty.”<sup>16</sup>

Some reasons why he left atheism include his conclusion, based on his decades of scientific research, that the creation of the Universe must have been the result of “a supernatural event that cannot be explained within the realm of physics as we know it. Science ... can’t take us ... to the First Cause. The sudden emergence of matter, space, time, and energy pointed to the need for some kind of transcendence” namely an intelligent creator.<sup>16</sup> Sandage added that the “world was too magical to be an accident”.<sup>17</sup>

In short, he concluded that the “world is too complicated in all its parts of interconnections to be [ultimately] due to chance” as Darwinism would have us believe.<sup>18</sup> Sandage stressed it was his scientific research “that drove him to the conclusion that the world is much more complicated than can be explained by science. ... It was only through the supernatural that I can understand the mystery of existence”.<sup>16</sup> Sandage added that he became

“... convinced that the existence of life with all its order in each of its organisms is simply too well put together. Each part of a living thing depends on all its other parts to function ... The more one learns of bio-chemistry the more unbelievable it becomes unless there is some type of organizing principle—an architect for believers, a mystery to be solved by science (even as to *why*) sometime in the indefinite future for materialist reductionalists.”<sup>13</sup>

An example of his concern about ‘material educationalists’ is, in 1975, when Sandage was eating lunch with the director of the Caltech news service, Graham Berry, he began talking about religion

“... in his usual enthusiastic manner. The couple at the next table started following the conversation. Finally the man got up, introduced himself as a minister, and asked if he could join them. He thought Sandage was a minister, too. Sandage was thrilled. ‘I don’t know what I would call myself,’ he said in 1977, describing the strange nexus between science and religion into which his pursuit of the stars had stuck him. ‘If you believe anything of the hard science of cosmology, there was an event that happened that can be age dated back in the past. And just the very fact ... that



**Figure 2.** Messier 82 galaxy in the constellation Ursa Major (the big dipper). Note what appears to be gas clouds surrounding the main bright object. Sandage spent his career studying stellar objects such as this. There are an estimated 100,000 separate galaxies, star clusters, and other stellar objects in the universe.

Photograph courtesy of NASA

cosmology can understand the universe at a much earlier state ... that was fundamentally different. Now that’s an act of creation. Within the realm of science one cannot say any more detail about that creation than the First Book of Genesis.”<sup>19</sup>

An important factor in his conclusion was the “second triumph in cosmology”, which was “the discovery that the universe as we know it has not existed forever”.<sup>20</sup>

Overbye wrote that, in the history of the scientific quest for the secret of the universe, of the many voices in this quest, “one voice speaks louder” than any other modern cosmologist, and that voice is Allan Sandage.<sup>21</sup> His search that led him to Intelligent Design has consumed much of his life. He wrote that from

“... an early age I was consumed by the mystery of existence: ‘Why is there something rather than nothing?’ I call this sense of wanting to uncover reality’s deepest meaning my ‘divine discontent.’ The first moment of astonishment came with the idea that there was a time before the world as we know it existed: there was a time when there were no humans, no living thing, no earth, no solar system, no galaxy, no chemical elements, indeed, no universe. With this realization, perhaps at the age of twelve, ‘origin research,’ whatever that may have meant to me at the time, became the dream of a vocation.”<sup>22</sup>

As a youth he reasoned that the central engine of the universe could be discovered through astronomy. He now realizes that this assumption was naive and

“... it took much searching to arrive at the answer. In fact, if there is to be any answer to that question, I believe it must lie outside the hard, rationalistic reductionism which is the hallmark of experimental science, both in the laboratory and the observatory.”<sup>13</sup>

He eventually accepted the Intelligent Design argument, concluding that “the universe is the only way it can be for us to exist” and “to ask to create a different universe is to ask” for

“Genocide ... the more I think about how everything is so finely tuned, the more that principle makes sense. Everything that you and I need to live is given to us on this earth. Maybe the universe cannot be any different than it is now for us to exist. So ... I wouldn't change a thing if I want to live.”<sup>23</sup>

When asked about Nobel Laureate Steven Weinberg's statement “*the more the universe seems comprehensible, the more it also seems pointless*,” printed in his book *The First Three Minutes*,<sup>24</sup> Sandage opined “that's a silly statement because the answer is not known. Pointless? The universe is so [very] mysterious in being tuned the way it is.”<sup>25</sup> Sandage added that accepting Weinberg's conclusion is

“... to end up like Nietzsche, sitting by a window for 7 years rocking, not talking to anybody because of his nihilism, is not the way ... Nihilism finally ends up in insanity ... To avoid that, I'm quite willing to believe there is a purpose [in life]. But it *is* a belief. Weinberg, in his sentence, also states a belief, and why he's driven to that is probably as complex as why I am driven to the opposite pole. But I am not willing to be a Nietzsche nihilist, because I think that is much more pointless.”<sup>26</sup>

Furthermore, Sandage concluded that he has identified the ‘organizing Force’

“... required as the ‘first cause’ in the ‘creation’ of the universe ... with the God of the Scriptures. In moving from one to the other ... the high plateau of reason on the one side and that of faith on the other. One cannot wait on the side of reason until one is certain. You must choose! ... My approach has been to decide to believe in the Scriptures ... for the great central engine of the universe behind the sciences, explaining what science cannot explain—namely *existence, purpose, value and free will*.”<sup>27</sup>

Weinberg, who was awarded the Nobel for his ElectroWeak Quantum Field Unified Theory, should understand, as Sandage correctly notes, that science cannot know the “uncaused ‘first cause’, which is outside of physics” because the universe cannot create itself and the typical

“... attempts to provide a scientific answer to the question ‘Can the universe create itself?’ implicitly start with a ‘first’ universe, out of which other universes are generated. It is here that I would ask Andrei Linde where his first universe came from that spawns his multiple baby universes *ad infinitum*. To say that the universe was created out of nothing by a ‘quantum fluctuation in the false vacuum’ is simply promiscuous use of smoke and mirrors; it is empty speculation with no experimental basis except that the universe does exist. Scientists who say that ‘we do not need to invoke a higher power’ simply mandate away any possible explanation outside the exceedingly narrow precepts of reductionist science.”<sup>28</sup>

A concern Sandage had was the origin of this false vacuum. Sandage called it a ‘false vacuum’ because, although it did not have any atoms in it, it has many subatomic particles such as neutrinos. Sandage added that faith is important to a scientist because, although physicists “are the cleverest people in the world”, and some persons will spend their life attempting to build “detectors that can detect single high-energy particles”, this activity requires

“... faith in the things unseen. I listen to the theoreticians talk, and they're in a magic world ... science has gone far beyond string and sealing in believing in the reality of things unseen, rather than in the assurance of things simply hoped for. They have become Bishop Berkeleyites.”<sup>29</sup>

Sandage was convinced that “both science and religion build models as guides to understand the mysterious reality behind the scenes” and that, in the final analysis, “models are all we have, both in science and in religion”.<sup>30</sup> Another critical factor in his conversion to theism and Christianity was the fact that the

“... fruits of faith as a pragmatic solution to the divine discontent of my youth with the deepest of problems of existence have not been insignificant. Faith has provided a brace against nihilism and the tragic despair of Nietzsche and Schopenhauer; an explanation of the problem of existence through belief in a Creator.”<sup>31</sup>

His faith was clearly reflected in his life. A co-worker, Cambridge University Astronomer Lynden-Bell, wrote that

“Sandage was open to new ideas and was generous and helpful to those who worked with him. He was a true gentleman and expected equally high standards of honor and acknowledgement from others. He never stopped working and has left us with a wider understanding of the scale of the universe and a greater wonder at the remarkable objects in it.”<sup>32</sup>

## Summary

Sandage is one of many scientists who recognized that the amazing design of the universe documents the existence of a designer, and this fact has convinced him to become a theist. He wrote that “many scientists are now driven to faith by their very work” in science.<sup>33</sup> Sandage also recognized that the scientific community is so scornful of theism that “there is a reluctance to reveal yourself as a believer, the opprobrium is so severe.”<sup>12</sup> He concluded

“... the realms of science and religion are nearly orthogonal [mutually independent]. It seems to me that scientists and theologians have climbed closely adjacent but different peaks. When each has reached their separate summits they can view one another, even exchange arguments and claims of hegemony over one another, but they are not close enough to one another for either to play king of the other’s mountain.”<sup>27</sup>

When asked “If you could design the universe any way that you wanted to, how would you do it?”, Sandage answered he would not change our ‘Creator’s’ design, noting that the

“... greatest mystery is why there is something instead of nothing, and the greatest something is the thing we call life. I am entirely baffled by you and me ... their sum now, in a living thing, is greater than the whole.”<sup>34</sup>

In the end, Sandage rejected Weinberg’s conclusion that human life as well as all life is “a more-or-less farcical outcome of a chain of accidents reaching back to the first three minutes ... and faces a future extinction of endless cold or intolerable heat.”<sup>24</sup> Of note is the fact that some of the major obituaries of Sandage totally left out his religious conclusions.<sup>32</sup>

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**Jerry Bergman** has nine academic degrees including two Ph.Ds. His major areas of study for his graduate work were in biology, chemistry, psychology, and evaluation and research. He graduated from Wayne State University in Detroit, Medical University of Ohio in Toledo, University of Toledo and Bowling Green State University. A prolific writer, Bergman has taught biology, chemistry and biochemistry at Northwest State in Archbold, Ohio for over 24 years. He is now an adjunct associate professor at The University of Toledo Medical College.

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