BOOKS FROM THE LIBRARY OF ALLAN R. SANDAGE
MARCH 2024

Astronomer Allan Sandage (1926-2010) determined the first reasonably accurate values for the Hubble Constant and the age of the universe and was considered "the greatest and most influential observational astronomer of the last half-century" (*New York Times* obituary, November 17, 2010).

He completed his physics degree at the University of Illinois in 1948, then became a graduate student at Caltech, where he "learned the nuts and bolts of observing with big telescopes [at the Mount Wilson Observatory] from the founders of modern cosmology, Hubble; Walter Baade, who became his thesis adviser, and Milton Humason" (*NY Times*).

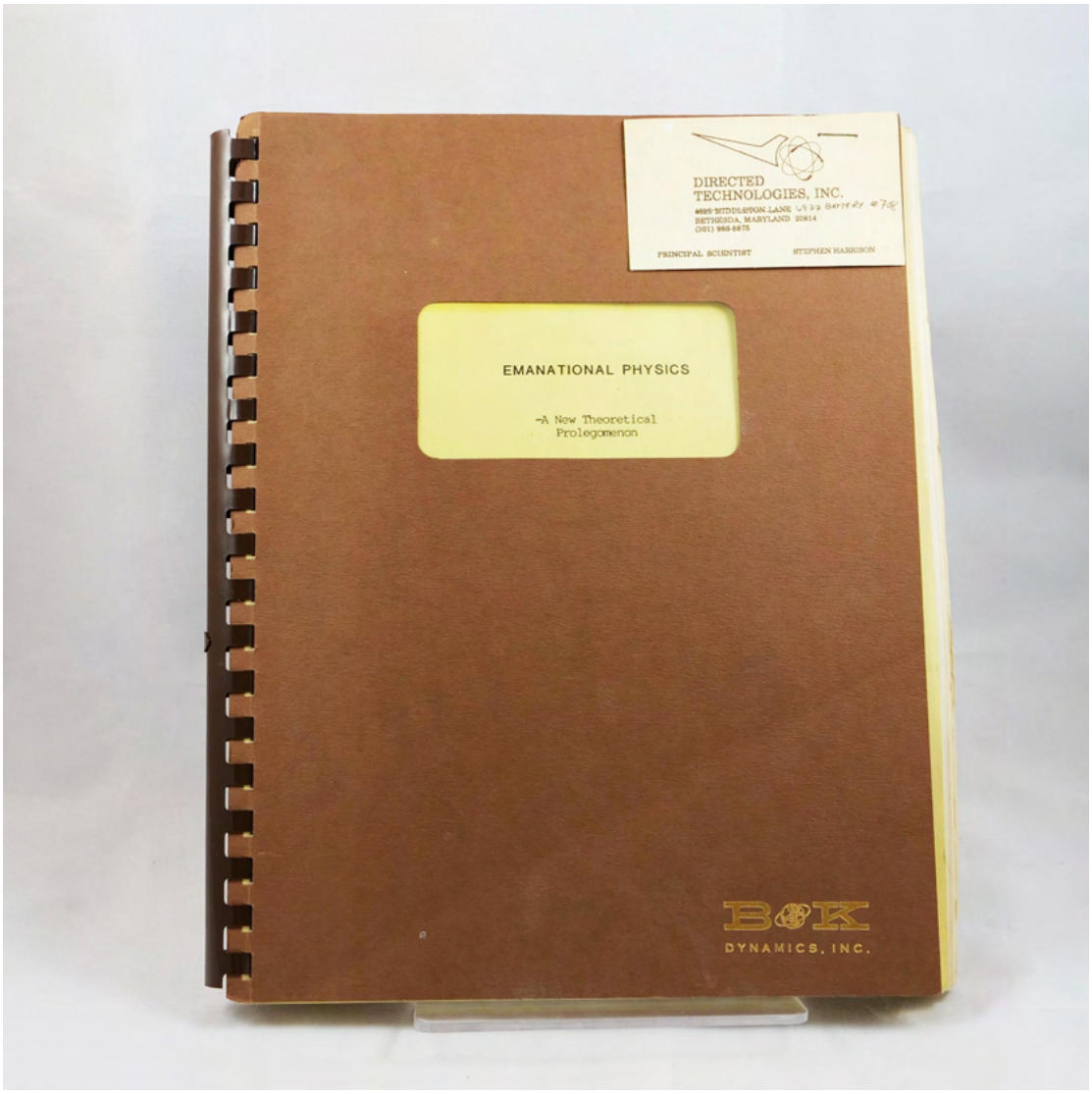
"For his doctoral thesis he studied the stars in the globular cluster Messier 3 and the RR Lyrae variable stars it contains. Refinements in the accuracy of the distances to variable stars became a recurring theme of his work, as these were the first step in determining the ladder of distances through which the true scale of the universe was measured" (*Guardian* obituary, December 9, 2010).

Sandage's first major contribution was the 1961 paper, "The Ability of the 200-inch Telescope to Discriminate Between Selected World Models", which "may well have been 'the most influential paper ever written in any field even close to cosmology'... It was to set the direction of observational cosmology for 40 years, ruling out the Steady State and the Big Crunch and culminating in the surprise discovery in 1998 that the expansion is not slowing down at all but speeding up" (*NY Times*).

Next, by investigating the motion of old stars in the Milky Way, he and two co-authors showed in 1962 "that that the Milky Way formed from the collapse of a primordial gas cloud probably some 10 billion years ago. That paper still forms the basis of science's understanding of where the galaxy came from" (*NY Times*).

Sandage and his colleagues continually revised the estimate of Hubble's constant, the speed at which the universe is expanding. "This allowed them to conclude that the universe was not slowing down enough for gravity to reverse the expansion into a Big Crunch. That was in happy agreement with astronomers who had found that there was not enough matter in the universe to generate the necessary gravity" (*NY Times*).

In 1991 Sandage was awarded the Crafoord Prize, the equivalent of the Nobel for observational astronomy.



CLEARING UP THE MESS OF MODERN PHYSICS

1. **Harrison, Stephen. Emanational Physics. A New Theoretical Prolegomenon. Second Edition.** Bethesda, Maryland: privately published, 1988. *Comb-bound photocopy, text on both the rectos and versos. Title on yellow paper. Original brown paper covers, the upper cover with a plastic window for the title and "BK Dynamics" embossed in gold. The author's Directed Technologies business card, with the address corrected by hand, is stapled to the upper cover. Illustrations, charts and graphs throughout, one coloured by hand. The author's name and address in pencil partially erased from the title. Occasional additions and corrections made by taping or pasting in new slips of paper.*

The "second edition" of this rare and unusual self-published text proposing to correct the entire field of physics by reframing it metaphysically. Described as a "not-for-sale" edition "limited to 100 copies", with Sandage's name appearing twice in the recipients list (once as no. 2 on the list, and then misspelled on a taped and glued-on addition) and an introductory letter from the author to Sandage, dated 1993, is loosely inserted.

We have been unable to locate much information on the author, Stephen Harrison. The biography on the verso of the dedication leaf describes him as "a science graduate of London University" and "now an American citizen" who is "currently an independent consultant in the 'High Technology' field in the Washington D. C. area". His business card describes him as the "principal scientist" for Directed Technologies, Inc. of Bethesda Maryland, of which we can find no record. The printed address on the card is for a suburban house, and it has been crossed out and corrected with another address for an apartment complex about a mile away.

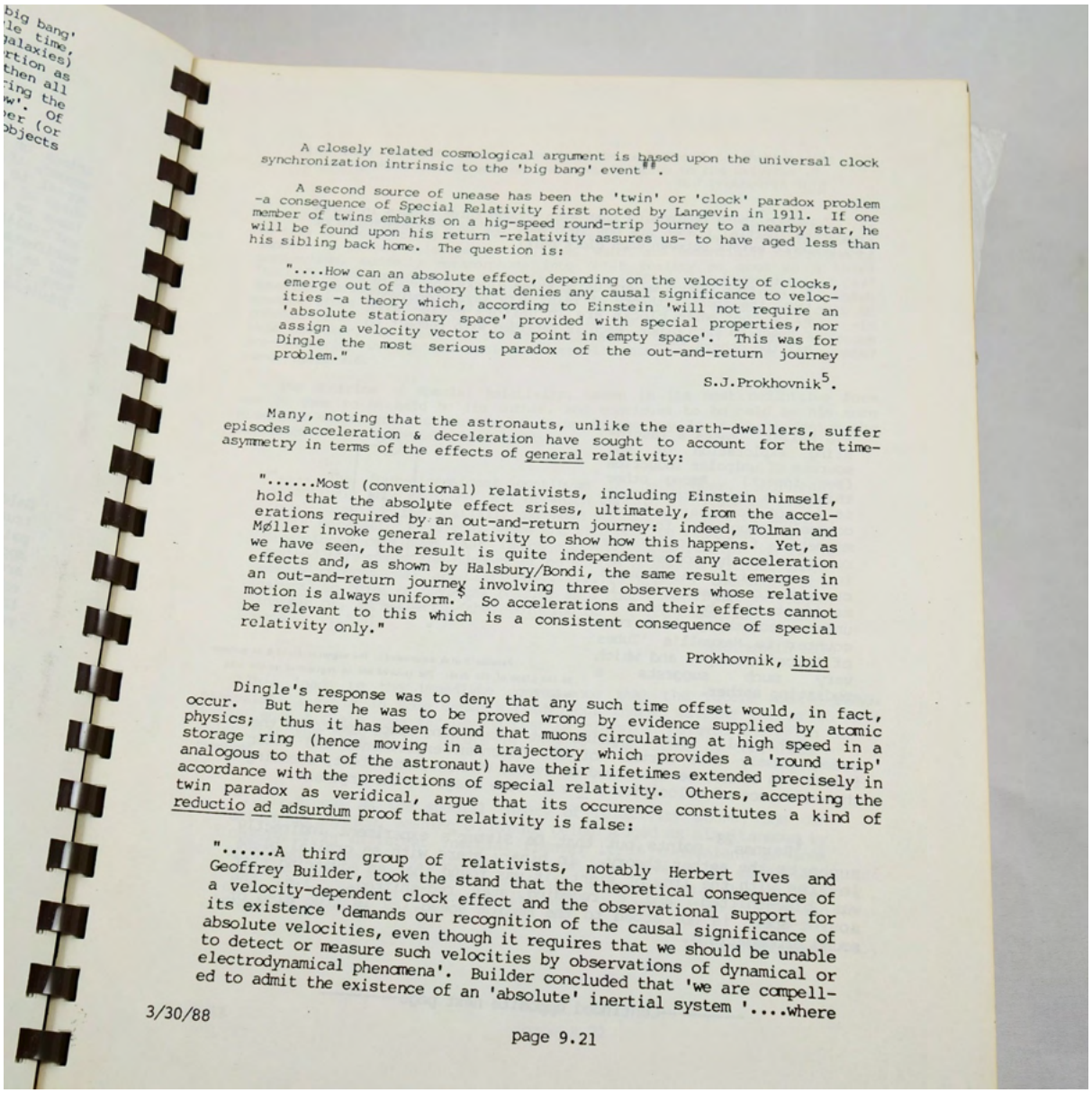
Surprisingly, Harrison has a Linkedin profile, though it is empty except for his title, "independent computer software professional, Bethesda Maryland" and his education history: "London University 1938-1948". There is no "London University" (at least not since 1836), and it is unclear whether this is entirely fictitious or if he meant one of the real institutions with a similar name. And while the dates seem questionable, as they put him in his late 80s when Linkedin was founded, an obituary confirming his age appeared in the Washington Post on March 16th, 2016: "Stephen Harrison, philosopher, author of *The New Monadology*, died peacefully March 12, 2016 at age 96 with his daughters Barbara Harrison and Frances Stroscio by his side".

In the prefatory matter Harrison lists three other books he has written: "The Mind/Brain Problem, copyright 1981/1982/1984/1986", "Artificial Intelligence: A House Built Upon the Sand, 1984", and "The New Monadology (forthcoming)". We can locate no institutional copies of *Emanational Physics*, and only one institutional copy of any of the other books: *The New Monadology*, at Purdue University, though the copyright date provided in WorldCat is 1981, which would be significantly earlier than indicated by the information here.

This copy seems have been mailed to Sandage a few years after "publication", as the enclosed letter is dated May 29th, 1993 (as Sandage's name appears twice in the recipients list, it may have been sent twice). Harrison writes, "I believe you will enjoy some of the chapters of the enclosed, though I fear you must end up dismissing me as a good man gone wrong. One of my complaints with modern cosmology is the way in which they proceed sui generis in the absence of the broader considerations of Mind and Spirituality — which are, so to speak, brought in as afterthoughts, rather than being given equal weight at the outset. Also, the failure to distinguish between Eternity and Endless Time; and between the Potential and the Completed Infinity. Finitude and Temporality, surely, belong in the realm of physical existence, with Infinity and Eternity providing the necessary context beyond."

The contents of this volume are difficult to describe, but comprise an elaborate, conservative-leaning pseudo-scientific/philosophical critique of modern physics and cosmology, primarily relativity, quantum mechanics, positivism, and materialist understandings of human consciousness. As Harrison writes in the preface, "It is no secret that the state of theoretical physics & cosmology is replete with contradictions and paradoxes. It's a mess — and, according to such Establishment spokesmen as Richard Feynman, there's not much we can do about it. Nature is 'absurd' and we have no choice but to accept the fact with as good a grace as we are able to muster. I don't believe it... What's wrong with physics takes origin, in my view, from what's wrong with physicists. What is chiefly wrong with physicists is that they are metaphysically light-weight... this handicap of philosophical myopia is canonised

into the virtue of emancipation; they believe that the findings and discoveries of physics have somehow pre-empted metaphysics — which may now be discarded as so much useless baggage — and that empiricism has somehow proved itself to be completely self-contained and self-sufficient."



A closely related cosmological argument is based upon the universal clock synchronization intrinsic to the 'big bang' event[##].

A second source of unease has been the 'twin' or 'clock' paradox problem -a consequence of Special Relativity first noted by Langevin in 1911. If one member of twins embarks on a hig-speed round-trip journey to a nearby star, he will be found upon his return -relativity assures us- to have aged less than his sibling back home. The question is:

"....How can an absolute effect, depending on the velocity of clocks, emerge out of a theory that denies any causal significance to velocities -a theory which, according to Einstein 'will not require an 'absolute stationary space' provided with special properties, nor assign a velocity vector to a point in empty space'. This was for Dingle the most serious paradox of the out-and-return journey problem."

S.J.Prokhovnik[5].

Many, noting that the astronauts, unlike the earth-dwellers, suffer episodes acceleration & deceleration have sought to account for the time-asymmetry in terms of the effects of general relativity:

".....Most (conventional) relativists, including Einstein himself, hold that the absolute effect srises, ultimately, from the accelerations required by an out-and-return journey: indeed, Tolman and Møller invoke general relativity to show how this happens. Yet, as we have seen, the result is quite independent of any acceleration effects and, as shown by Halsbury/Bondi, the same result emerges in an out-and-return journey involving three observers whose relative motion is always uniform.[$] So accelerations and their effects cannot be relevant to this which is a consistent consequence of special relativity only."

Prokhovnik, ibid

Dingle's response was to deny that any such time offset would, in fact, occur. But here he was to be proved wrong by evidence supplied by atomic physics; thus it has been found that muons circulating at high speed in a storage ring (hence moving in a trajectory which provides a 'round trip' analogous to that of the astronaut) have their lifetimes extended precisely in accordance with the predictions of special relativity. Others, accepting the twin paradox as veridical, argue that its occurence constitutes a kind of reductio ad adsurdum proof that relativity is false:

".....A third group of relativists, notably Herbert Ives and Geoffrey Builder, took the stand that the theoretical consequence of a velocity-dependent clock effect and the observational support for its existence 'demands our recognition of the causal significance of absolute velocities, even though it requires that we should be unable to detect or measure such velocities by observations of dynamical or electrodynamical phenomena'. Builder concluded that 'we are compelled to admit the existence of an 'absolute' inertial system '....where

3/30/88

page 9.21

Not surprisingly, he goes on to explain that, "undaunted by my limited grasp of modern physics, I decided to blunder in, and try my hand at clearing up the mess. What are my credentials? First, I am familiar with the basics and have enough understanding of mathematics to be able to protect myself from the occasional abuses of mathematicians. I have spent much of my life as a consultant in various areas of 'hard' science and engineering, and my experience in this occupation has caused me to become monumentally unimpressed by and suspicious of 'experts'; one thing in which many of them are truly expert in is seeing the trees and missing the woods".

The text itself is dense and complex, with numerous citations and illustrations, a few of which are coloured in by hand. It begins with an introduction to some of the

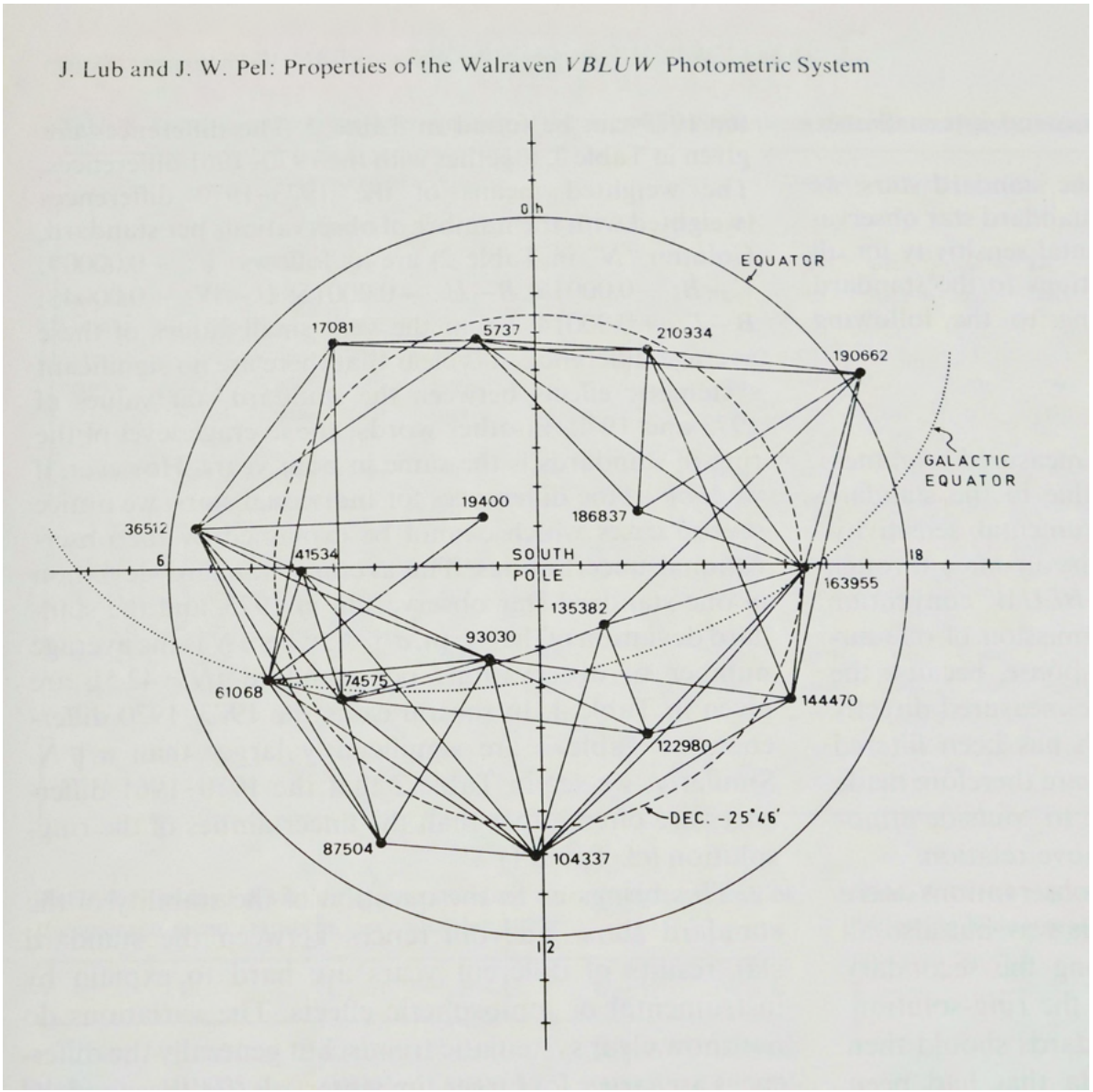
mysteries and paradoxes of modern physics and a historical outline of "how we got into the present mess", as well as chapters titled "Ad Hominem: The Intellectual Scrutinized" and "The Decay of Common Sense". Harrison's solution to these problems, a system he terms "emanational physics" involves building blocks called "corpuscles" and "reintroducing the Aether" to theory, and it covers the mind, the fabric of the universe, and his conceptualisation of the origin and end of the universe — what he calls the Alpha and Omega.

In the preface, Harrison explains that this second edition has appeared only six months after the first, "chiefly as a result of my very recent discovery of literature sources critical of relativity. At the same time I learned why I had to dig so deep to find this material; it seems it is not easy to publish material contrary to the Establishment Doctrine... In reviewing this material I cannot help but conclude that the case against special relativity is about as solid as can be... I am even tempted to say that it is the most disconfirmed hypothesis since the Phlogiston Theory. Yet it retains its firm occupancy of Stage Center".

Among the 90 recipients of this text (who must have been thrilled) are mathematician Roger Penrose, AI and information theorist Kenneth M. Sayre, and physicists Murray Gell-Mann, Steven Weinberg, Stephen Hawking, Freeman Dyson, John Archibald Wheeler, James Hartle, and Sheldon Glashow. A number of non-scientists are also included, such as the conservative political philosopher Paul Gottfried, Scottish Protestant theologian Thomas F. Torrance, Benedictine historian of science Stanley Jaki, and religious philosopher Richard Swinbourne.

Most remarkably, at least a few of them engaged somewhat seriously with Harrison's text. In the preface he thanks "a number of readers who sent in their comments in response to the original edition — spanning various degrees of agreement and disagreement; several of them brought an important error to my attention (concerning the astronaut round-trip paradox)". Mathematician Joseph Gerver is specially praised for "his very detailed commentary on a number of points". And not only did neuroscientist and philosopher Raymond Tallis read *Emanational Physics*, he cited it in his 1991 book on consciousness, *The Explicit Animal*. Harrison had used a quotation he attributed to physicist David Bohm, and Tallis includes it in *The Explicit Animal*, with a footnote reading, "I do not know the original provenance of this passage. It is cited by Stephen Harrison in his remarkable unpublished manuscript *Emanational Physics*". The same passage is then used by philosopher Mary Midgley in her book *The Ethical Primate*, with a footnote referring to Tallis and Harrison".

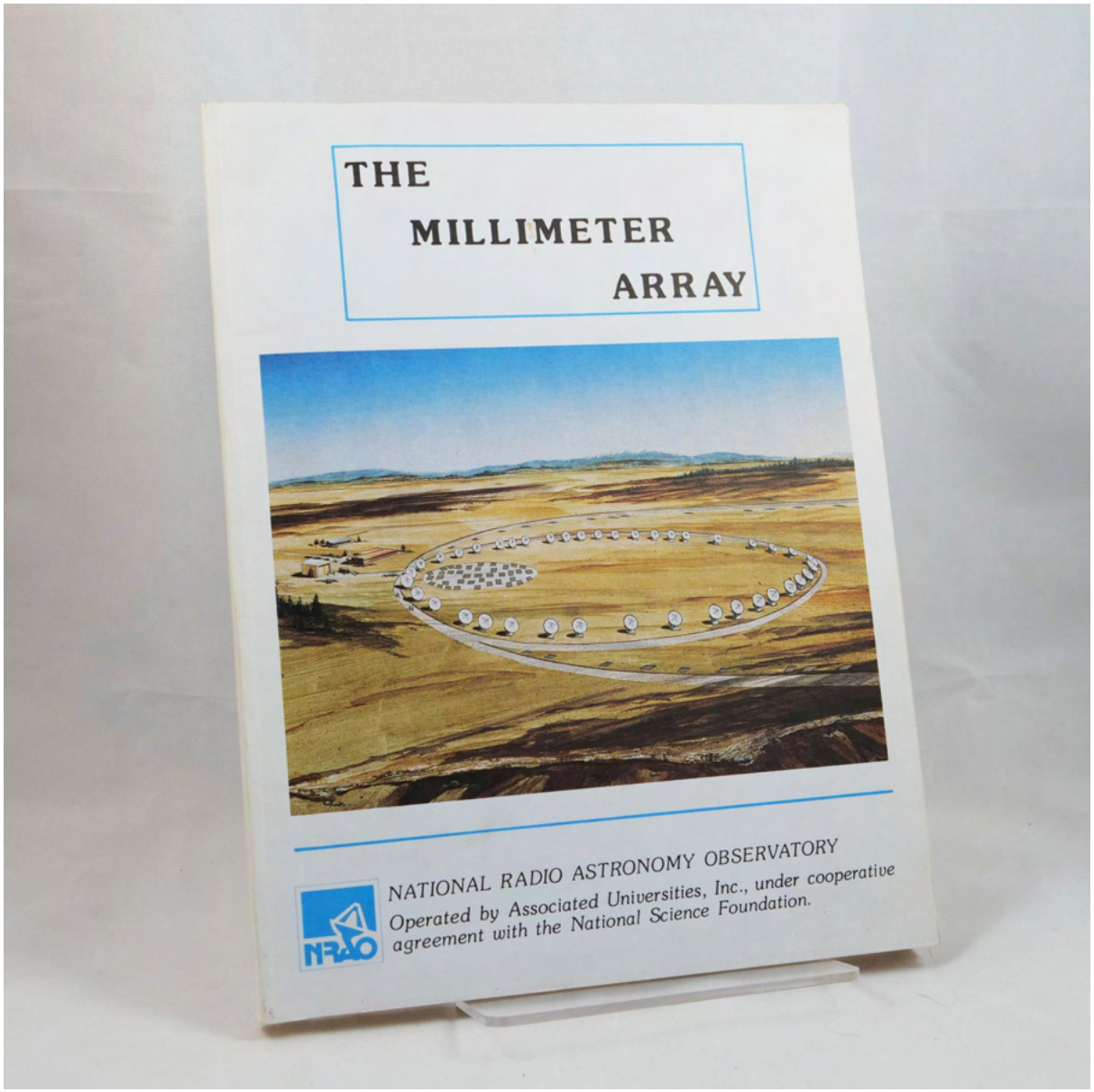
00849 **£650**



2. **Lub, Jan. The RR Lyrae Population of the Solar Neighbourhood.**
Proefschrift ter Verkrijging van de Graad van Doctor in de Wiskunde en Natuurwetenschappen aan de Rijksuniversiteit to Leiden...
Amsterdam: University of Leiden, 1977.
Perfect bound, original red wrappers printed in black. Charts and graphs within the text. Wrappers a little creased and rubbed, tears to the spine repaired with clear tape, head of spine bumped also affecting the contents. Good condition.

The PhD thesis of University of Leiden astronomer Jan Lub, who specialises in "the molecular interstellar medium, galaxy centers, star formation and dwarf galaxies & Magellanic Clouds". The RR Lyrae are periodic variable stars that are commonly found in globular clusters and are used as standard candles to determine distances. They were the basis for Sandage's PhD thesis and "refinements in the accuracy of the distances to variable stars became a recurring theme of his work" (*Guardian* obituary).

00845 **£30**



3. **(Sandage, Allan R.) National Radio Astronomy Observatory, Associated Universities, Inc. The Millimeter Array. Proposal to the National Science Foundation.** United States: Associated Universities, Inc., July 1990.
Perfect bound. Original white wrappers, title and publisher information in black and colour illustration of the proposed array to the upper cover. Illustrations, charts, and graphs throughout. Head of spine bumped, edges of the wrappers very lightly rubbed, a few small spots and marks. Very good condition.

First edition, first printing of the proposal for the US telescope array that would become part of the Atacama Large Millimeter Array. With a loosely inserted consulting agreement for the National Radio Astronomy Observatory signed by Sandage.

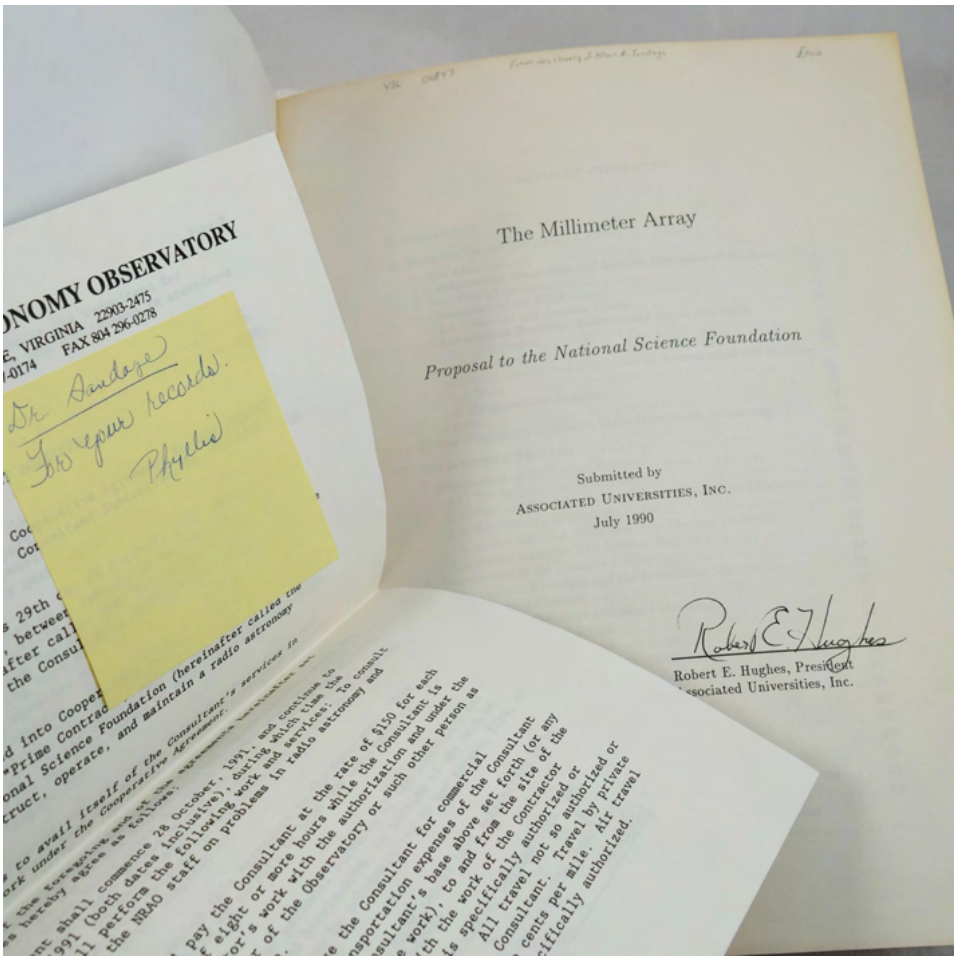
During the 1980s astronomers identified a need for telescopes that could more precisely image the electromagnetic spectrum, down to the millimeter and sub-

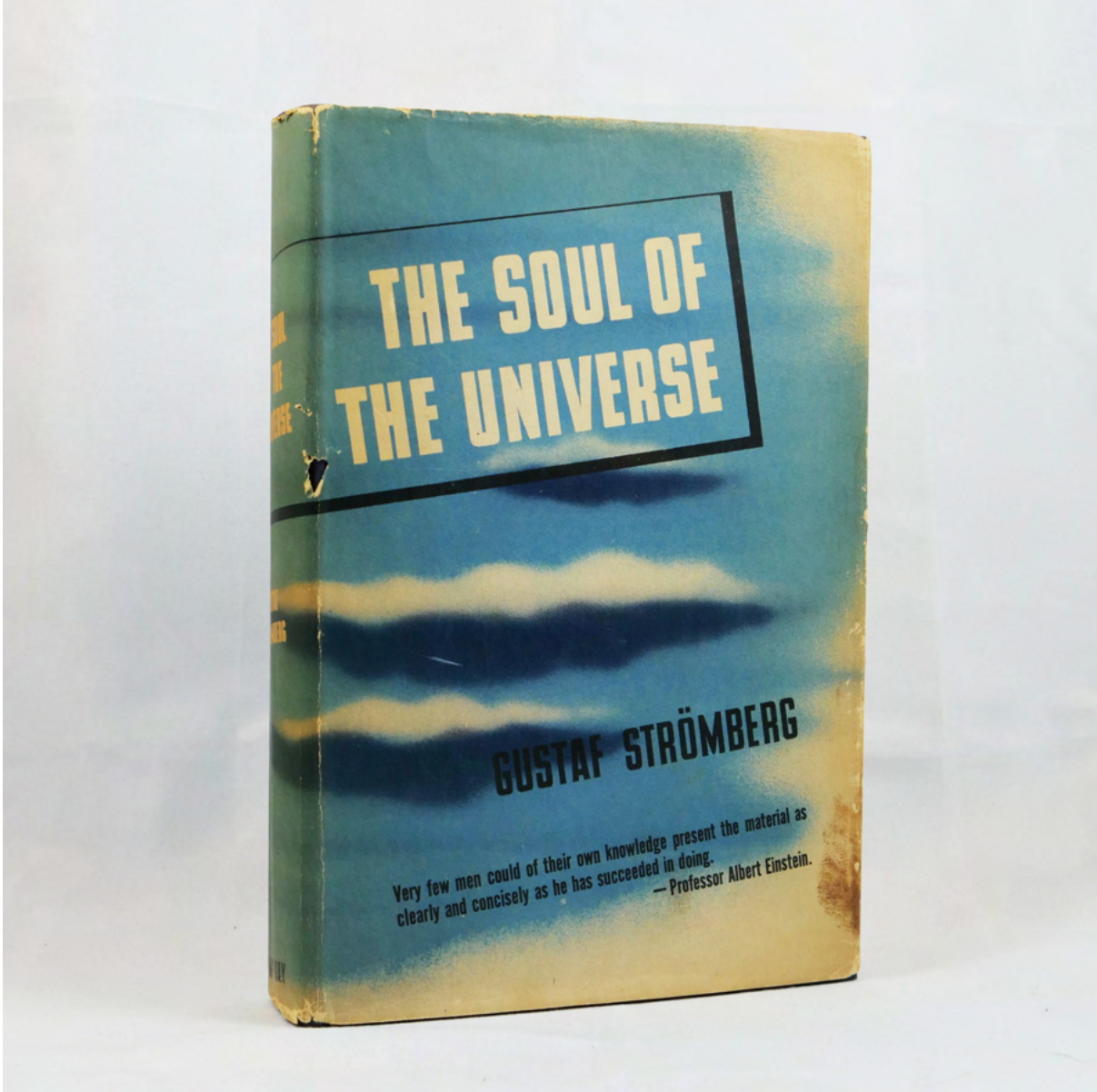
millimeter wavelengths. Research bodies operating independently in different parts of the world began feasibility studies, and “the National Radio Astronomy Observatory (NRAO) in the United States planned a project called Millimeter Array (MMA), which considered the construction of 40 antennas with 8-meter diameters, reaching an atmospheric window of 30 to 350 GHz to receive millimeter wavelengths. In parallel to this, the European Southern Observatory (ESO) planned the Large Southern Array (LSA)” and “the National Astronomical Observatory of Japan (NAOJ) proposed the construction of a Large Millimeter/Submillimeter Array (LMSA)... But it soon became evident that such ambitious projects could not be developed by a single community, and they decided to join forces.” (ALMA Observatory website).

Construction of ALMA began in 2003 in the Atacama Desert of Chile, and scientific observations began in 2011. Since then the array has studied the molecular components of comets; imaged a protoplanetary disc forming around the star HL Tauri, showing that protoplanets can form much earlier in a star’s life cycle than expected; and was part of the research project that produced the first direct image of a black hole in 2019.

Sandage apparently agreed to serve as a consultant on the Millimeter Array project in the year after this proposal was published, as a signed copy of the agreement, dated October 29th, 1991, is loosely inserted here.

00847 **£100**





DOUBLE PRESENTATION COPY

4. **Strömberg, Gustaf. The Soul of the Universe.** Philadelphia: David McKay Company, 1940.
Octavo. Original blue cloth, titles to spine gilt. With the dust jacket. Some uneven tanning of the endpapers, contents faintly toned. A very good copy in the rubbed, nicked, and tanned jacket with some dark marks and a few chips.

First edition, first printing. Presentation copy inscribed on the front free endpaper, first from the author to astronomer Frank E. Ross: “With best wishes from Gustaf Stromberg, April, 1940”. Later, on June 1, 1954, Ross inscribed the book for “Dr. A. R. Sandage, Comps of F. E. Ross”.

Author Gustaf Stromberg (1882-1962) was an astronomer at the Mount Wilson Observatory in California who specialised in the luminosity of long-period variable stars and on stellar motions and their implications for the movements of galaxies and nebulae. He also became interested in psychic and paranormal phenomena, and

published his pseudoscientific theories about the spiritual aspects of matter and the soul's immortality in the present volume.

Frank E. Ross (1874-1960) earned his doctorate in 1901 at the University of California, then served as director of the International Latitude Observatory station in Gaithersburg, Maryland, as a physicist at Eastman Kodak, and finally as an astronomer at the Yerkes Observatory in Wisconsin. Among his important contributions were the design of wide-angle lenses for astronomical photography; solving problems with photographic emulsions that had caused distortion in astronomical photographs; the discovery of many new variable and high-motion stars; the delineation of the large-scale structures of the northern Milky Way using the lens he developed; and important investigations of the surfaces of Mars and Venus (Morgan, National Academy of Sciences biographical sketch, 1967).

00850 **£200**

5. **[Vyssotsky] Williams, Emma T. R., et al. The Fundamental Properties of the Galactic System.** Annals of the New York Academy of Sciences Volume XLII, Art 2. Pages 113-272. New York: by the Academy, October 15, 1941. *Octavo. Original tan wrappers printed in black. Charts and graphs within the text. Ownership initials in black ink to the upper wrapper. Some loss from the ends of the spine, wrappers rubbed and toned with few small marks and some mild creasing. Very good condition.*

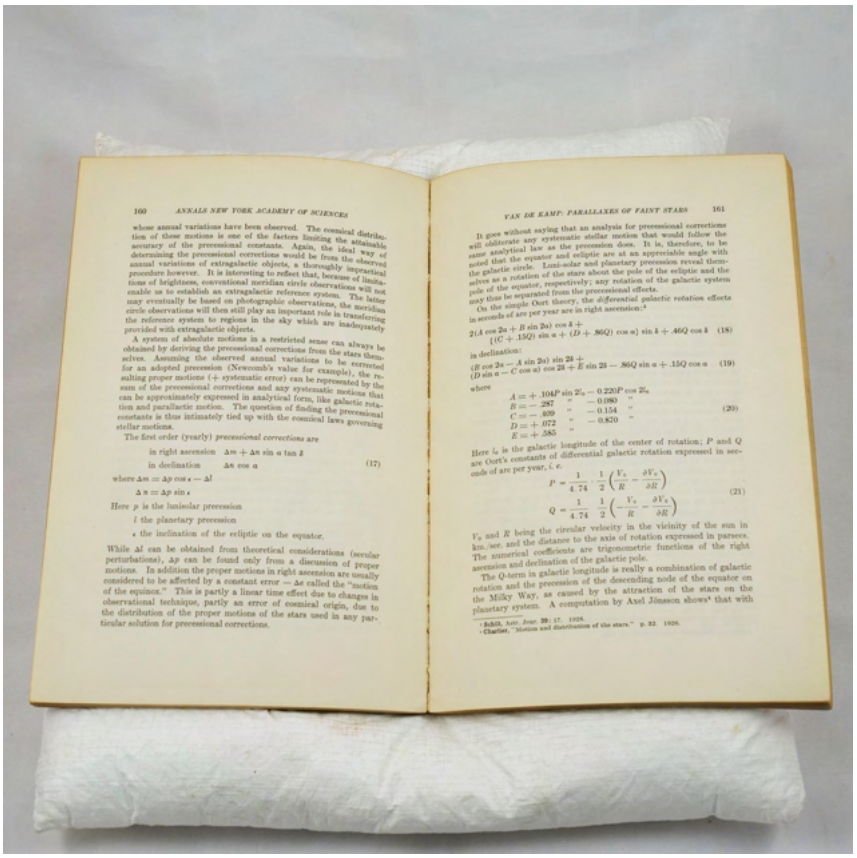
First edition, first printing of this collection of eight papers from the New York Academy of Science conference The Fundamental Properties of the Galactic System, held in New York on May 2nd and 3rd, 1941. One of the papers, “Mean Parallaxes from Peculiar Motions”, is by the prominent female astronomer Emma Vyssotsky (née Williams). With the ownership initials of Sandage’s wife, the astronomer Mary Connelly, who had studied at Indiana University and Radcliffe, and was teaching at Mount Holyoke when they met (*New York Times* obituary, November 17, 2010).

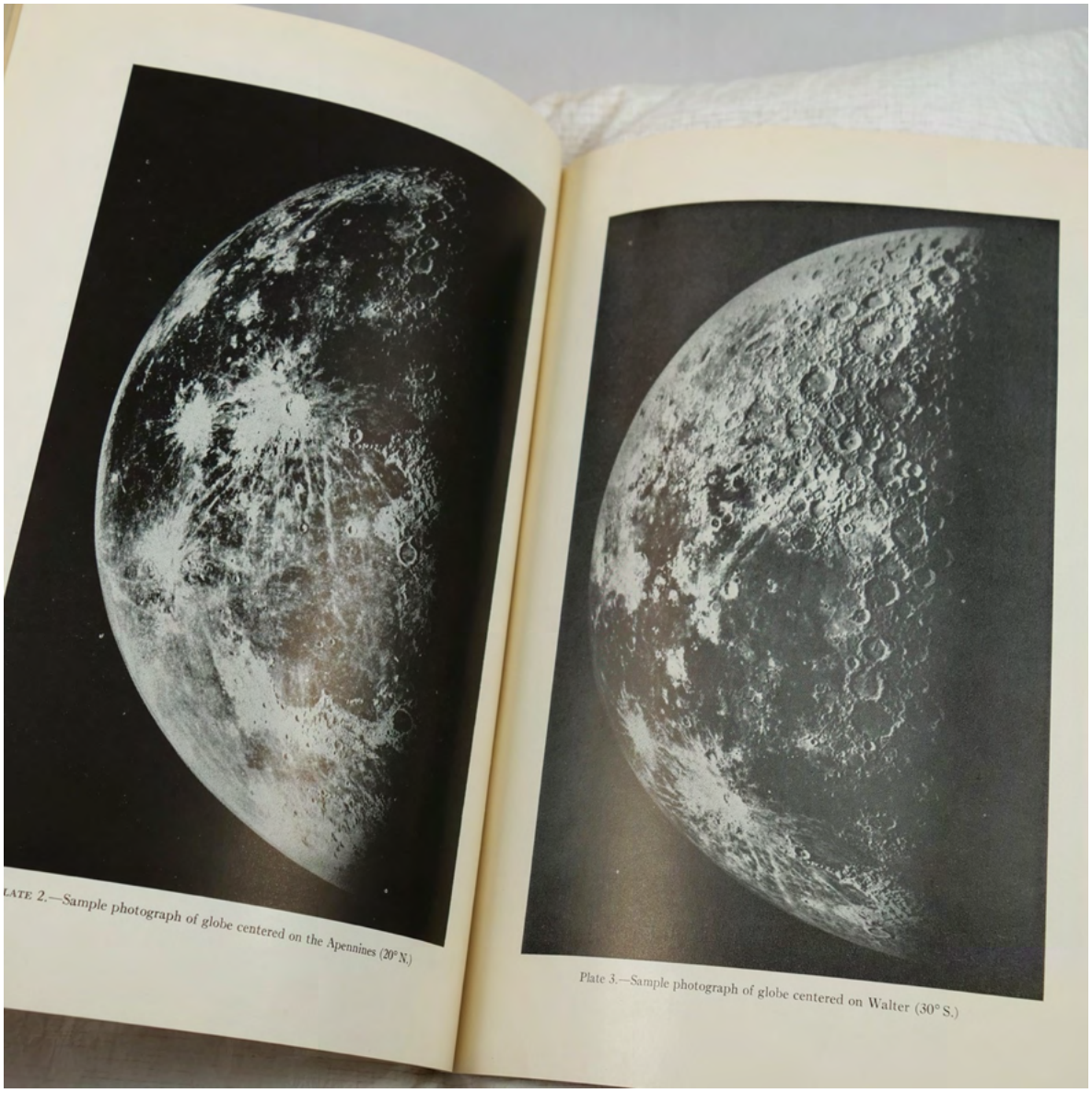
Vyssotsky (1894-1975) studied mathematics and astronomy as an undergraduate at Swarthmore, then researched A-type (young, energetic) stars from the Harvard Observatory for her Radcliffe PhD. While she was a postgraduate researcher at the University of Virginia's McCormick Observatory she met and married fellow astronomy Alexander N. Vyssotsky. "She remained for the rest of her career at the University of Virginia, first as a research fellow and instructor in astronomy, and then, at age fifty, began to work with her husband on a book on stellar motions, published four years later" (Ogilvie, *Biographical Dictionary of Women in Science*, p. 1333).

Vyssotsky and her husband studied "stellar parallaxes by applying trigonometric functions to observations made on multiple photographic exposures. They discovered many of these parallaxes by attaching a special objective prism to the observatory's astrograph. Their research led to accurate calculations of stellar motions and the determination of the structure of galaxies" (Oakes, *Encyclopedia of World Scientists*). In 1946 Vyssotsky was awarded the American Astronomical Society's Annie Jump Canon Award in Astronomy in recognition of her contributions to the field of stellar spectra.

This volume also contains papers by Peter van de Kamp, Dirk Brouwer, W. J. Luyten, Jan Schilt, and Frederick Seares, among others. It was edited by astronomer Bart J. Bok, who met Sandage when he was an undergraduate and was influential in the direction his career took.

00844 **£450**





6. **Wright, F. E, F. H., and Helen. The Lunar Surface: Introduction**
Reprinted from Middlehurst and Kuiper: The Moon, Meteorites, and Comets (The Solar System, Vol. IV). Chicago: The University of Chicago Press, 1963.
56-page pamphlet, wire-stitched. Original buff wrappers printed in black. 3 double-sided plates, illustrations and charts within the text. Wrappers a little creased and toned, with some small marks and scratches, minor crease affecting the lower corner of the contents. Very good condition.

A rare offprint of a book chapter by the geologist and optical scientist who was considered the foremost authority on the Moon. This copy is inscribed for presentation, probably to Sandage's wife Mary, by Wright's daughter and co-author, science historian Helen Wright. Worldcat locates only two other copies of this offprint, at the Huntington and the US Naval Observatory.

Frederick Eugene Wright (1877-1953) spent much of his career at the Carnegie Institute, where he led the Moon Project at the Mount Wilson observatory and "specialized in mineralogy, crystallography and petrology. He developed various

optical instruments, chiefly for petrology, and also wrote on the manufacture of optical glass... Wright took a special interest in studying the Moon. He charted all aspects of the orb from its chemical and mineralogical content to the characteristics of its craters and seas and its temperatures. So extensive and detailed was his work that the Moon's Wright Crater is named after him and two other astronomers" (Optical Society of America biography).

Wright's daughter Helen began her career as an assistant at Mount Wilson, researching the history of telescopes, and she also worked at the Vassar and U. S. Naval Observatories. Among her publications were biographies of astronomers George Ellery Hale and Maria Mitchell. She has inscribed this copy "Speaking of the Moon! All the best, Helen Wright". We strongly suspect that it was inscribed for Allan Sandage's wife, the astronomer Mary Connelly, who had studied at Indiana University and at Radcliffe, and was teaching at Mount Holyoke when they met and married.

00848 **£450**