SAMPLE

Cosmic Explorers: Space Colonies

Living Beyond Earth

Aira Astralis

Free sample: Introduction & Chapter 1

putrabooks.github.io

Buy the full book:

Carousell carousell.sg/p/cosmic-explorers-space-colonies-ebook-pdf-1468083541

Ko-fi

Payhip

Contents

Introduction

Chapter 01: The Idea's Biography

Chapter 02: The Reasons and Their Weight

Chapter 03: The Real Estate

Chapter 04: The Habitats in Orbit

Chapter 05: The Ground Sites

Chapter 06: The Life Support Problem

Chapter 07: The Gravity Question

Chapter 08: The Radiation Ledger

Chapter 09: The Economics

Chapter 10: The Law of the Frontier

Chapter 11: The Sociology of the Town

Chapter 12: The Road

Conclusion

This free sample contains the Introduction and Chapter 1. The complete book contains the full contents above.

Introduction

This volume is about the oldest new idea in spaceflight: that people might not just visit space but live there, in settlements that build, grow, and continue on their own. The subject enters as science fiction's wallpaper and leaves as an engineering and social problem with real numbers attached, the cost of lifting mass, the price of shielding a family from radiation, the art of recycling a farm's worth of air and water, the questions of law and governance no settled off-world town has yet answered. The walk covers the whole ground: the idea's history, the reasons, the places, the habitats, the life support, the gravity, the radiation, the economics, the law, the sociology, and the road.

The route sheet hangs at the trailhead: eleven stations, each read the same way, by the hardware that exists, the hardware that is drawn, and the honest gaps between the two, with every disputed figure argued in the open and every settled fact settled plainly. The reader finishes knowing what a colony actually costs in mass, energy, and people, which is the knowledge the posters leave out.

The conventions wait by the door. Costs are quoted per kilogram to orbit with their dates attached, since the number has been moving, populations are sized from the published engineering studies, and every projection is labeled a projection, the confidence stated beside it. The subject attracts both salesmanship and reflexive scorn, and the volume's arithmetic answers both.

Two readers share the trail: the enthusiast who wants the case made properly, and the skeptic who wants the weak points named without mercy. The same plain voice serves both, because on this subject the honest account is the interesting one.

The tone is set at the trailhead: the idea of settling space is neither destiny nor absurdity, it is a large project with known physics, half-built industry, and unsolved social science, and the book treats all three as what they are. Enthusiasm is welcome at the table, and so are the bills.

The honest price of the walk: colonization is the one space topic where the engineering is mostly the easy part, and the account says so early, because the life support, the psychology, the law, and the money have killed more paper colonies than the rockets ever have.

One working rule travels the whole route: no colony on these pages is finished before its mass budget, its power budget, and its people count are printed, the discipline kept to the final chapter, because the subject's history is a museum of unbuilt blueprints, and this book does not add to the exhibit.

A stake is posted at the trailhead, the account's own honest ground: the settlements described here are engineering that has not been done, sized by physics that has, the telling distinguishes throughout between the tested, the calculated, and the advocated, the reader given the tools to price each claim rather than the mood to believe it.

A note on the cast: the account keeps the personalities out of the arithmetic, the schoolteacher who derived the rocket equation and the professor who drew the cylinders both filed as evidence of the idea's seriousness rather than as authorities, the engineering judged by its own numbers, the advocacy priced separately from the physics.

The neighboring shelves are signposted at the forks: the launch vehicles' own volume holds the rocketry, the Mars-living volume holds that planet's case in full, the habitats volume holds the structures' engineering, and this book holds the settlement question whole, with the crossings marked where they occur. The walk begins with the idea's own biography.

State the subject's two meanings before the surveys begin. A space colony is two different dreams wearing one word: the outpost, a research station on another world, flags and rovers, a continuation of the exploring era; and the settlement, a town that lives without resupply, people born and raised off the Earth, a break with every previous era; see the two separated honestly throughout the book, since the outpost exists and the settlement does not, and the subject's public confusion, the treating of the first as proof of the second, is the book's standing target, with every chapter's question being not whether the species can visit, which is settled, but whether it can dwell, which is the whole open case.

Hand the reader the book's test as the standard to apply throughout. A settlement, by the book's definition, closes its loops: the air grown, the water cycled, the food raised, the children raised, the machine parts printed, the population replenished, and the colony that cannot do these things is an outpost with a longer lease; apply the test to every proposal the chapters survey, the orbital habitats, the lunar towns, the Martian cities, and score them not by their rockets but by their plumbing, since the frontier's whole question is the plumbing, and the book's arc, from the idea's history to the open road, is the story of the plumbing getting slowly, expensively, closer to closed.

Third stands the method: one rule of construction runs beneath every chapter, offered to the reader up front rather than discovered late. The chapters treat the settlement proposals as engineering, scored by their physics and their ledgers, and the book's advocacy is for the arithmetic rather than any address:

every proposal gets its credit and its bill, and read the chapters as a briefing, not a brochure; the book's single conviction, stated up front, is that the question deserves the arithmetic, and the frontier's advocates and skeptics alike owe the subject more than slogans, which the chapters attempt to supply.

Chapter 01: The Idea's Biography

The dream is older than the hardware by centuries. The seventeenth century's astronomers imagined travelers on the Moon, the nineteenth's satirists built whole societies off-Earth, and the spaceflight pioneers of the early twentieth century, the schoolteacher who worked the rocket equation and the engineers who followed him, treated settlement as the point of the whole enterprise, the rocket a means and the human spread the end. From the first, the colony was the goal and the launch a chore.

The idea acquired engineering flesh in the mid-century. The first serious designs for orbital habitats appeared in the decades after the Second World War, and the 1970s were the subject's golden age on paper: the Princeton conference where the physicist Gerard O'Neill posed his famous question to a classroom, is a planetary surface the right place for an expanding civilization, and the students' answer became a book, the book became a movement, and the movement drew the cylinders, the tori, and the spheres that still define the vocabulary. The L5 Society enrolled thousands of members on the strength of those drawings.

The same era's counter-current deserves its honest line: the planetary scientists' Mars missions drew the public eye, the orbital colony movement's economics met the decade's pessimism, and the drawings stayed drawings. The settlement idea passed from the popular press into the long dormancy of the late century, kept alive by the enthusiasts' societies and the fiction, while the actual spaceflight of the era built stations rather than settlements.

The revival arrived with the new century's cheap launch. The reusable boosters cut the price of mass to orbit, the commercial station projects multiplied, and the old drawings began their return from the filing cabinet, this time with launch prices attached that made the arithmetic less absurd. The idea's biography is thus a loop: a century of proposals, a pause, and a reopening, and the account traces the loop plainly.

The fiction's own role deserves its honest line, the mirror the ideas were drawn in. The orbital wheel and the domed farm were drawn by the writers decades before the engineers priced them, the fiction a testing ground for the sociology and the politics the studies skipped, and the account credits the mirror without confusing it with the blueprint, the settlement literature always being the two papers stapled together, the engineer's and the storyteller's, and both needing the other.

Leave the dormancy's artifacts on the record, the movement's paper trail. The societies' newsletters, the conference proceedings, the studies' colored

renderings are archived in the libraries now, the record of a movement that peaked early and kept its filing, and the account closes the idea's biography with the archive's own lesson, the proposals were serious even when the budgets were not, the drawings filed in earnest, the reopeners inheriting a real literature rather than a blank page.

The names stand as the idea's own monument, worth one line here. The orbital settlement studies' names are now attached to asteroids and craters, the pioneers' memorials in the sky they drew, and the account notes the custom's meaning, the field honoring its architects with the real estate they never got to build, the idea's biography closing on its own monument, the names in the catalog, the drawings in the archive, the road at last under construction.

The schoolteacher's chain of stations deserves its card: the deaf Russian teacher who worked out the multi-stage rocket in the 1890s and then imagined the stepping stones outward, the stations, the greenhouses, the settlements, the account keeping the chronology honest: the settlement idea was a corollary of the rocket equation before any rocket flew, the dream and the machine born in the same notebook.

The summer study earns its paragraph, the 1970s' own peak: the university-and-laboratory design exercise that produced the wheel habitat, the thousand-family torus sketched with 1970s slide rules, the account pricing the study's meaning: the first engineering-honest settlement design, the wheel still the field's standard icon, the study both the idea's proof of seriousness and the source of its over-optimism, the account keeping both verdicts visible.

The professor's cylinders earn their card: the large-scale habitats proposed as the answer to the energy and land questions, the paired counter-rotating tubes with the windows and the farms inside, the account pricing the proposal's history honestly: the physics was sound and the economics were the century's own bet on cheap launch, the cylinders kept as the idea's most audacious entry, audacity priced as data.

Close the file on the movement's brief life: the societies founded to lobby for the orbital frontier, the maps drawn of the liberation-point addresses, the account keeping the movement's fate honest: the advocacy outlived its moment, the membership aged, the ideas migrated into the agencies' long-range papers, the movement's biography the reminder that settlement enthusiasm runs on the launch-cost curve, the pendulum honest about its driver.

The comic strip's satellite earns a card, the idea's own popular route: the mid-

century newspaper strips teaching the wheel stations to the newspaper-reading public, the rotating habitat a Sunday-panel icon decades before the engineering, the account pricing the popularization: the dream's widest classroom was the funny pages, the idea's biography honestly including its cartoons.

The honest summary: space colonization has never been a fringe notion but a standing proposal with a serious engineering literature now entering its second century, and its failures have been economic and social far more than physical. The walk now turns from the idea's history to its reasons, the case that keeps it standing.

Let the idea's biography close on the tube's vindication, the history's neatest loop, a joy to trace. The rotating habitat, drawn on paper with a slide rule in the era of slide rules, dismissed as fantasy for the decades the rockets were busy with flags, is now the commercial stations' planned architecture, the physics having waited for the market; see the biography's lesson, that the old idea was right about the physics and wrong about the timing, and the settlement era's designs are accordingly the paper tubes with modern invoices, the frontier's oldest plan arriving on the newest freight, the idea outliving its every dismissal.

One more biography entry, the ocean liner's lesson, is the idea's standing evidence, worth holding. The great ship programs of the migration eras, the transports that moved millions across oceans, were the species' rehearsal for the settlement: closed environments, recycling, voyage medicine, the whole town-in-a-can; see the liner's graduation to the station and the station's to the habitat as one lineage, the closed environment's engineering having its own history, parallel to the rockets, and the settlement era's true pedigree is less the missile than the ocean liner, the frontier arriving with the traditions of the sea more than the habits of the war.

The dormancy's own calendar gets a line here, the idea's patient decades. The orbital colony concept slept through the era of shorter horizons, the engineering drawings aging in the archives between the first proposals and the renderings, the account keeping the sleep's meaning, the idea being dormant rather than dead, the papers being cited when the launch costs began their long fall, the biography's arc being the field's own lesson, that ideas in engineering wait for economics rather than for physics, the tube's vindication arriving when the freight bill made the drawings buildable, the biography closing on the standing note that the idea is now scheduled rather than merely imagined.

The biography's cast gets one more file entry, the idea's institutional homes.

The concept has lived in universities, in space agencies' design houses, in the societies that publish the journals, and now in the boardrooms of the launch companies, the account keeping the address changes honest, each home having given the idea a different accent, the academic drawings being elegant, the agency studies being sober, the corporate renderings being scheduled, the biography's institutional ledger closing on the standing observation, the idea is now being priced rather than being sketched, and pricing is the biography's last name.

End of free sample. The full book is available at putrabooks.github.io

ABOUT THE AUTHOR

Aira Astralis is a science writer specializing in astronomy and space exploration. Her work spans the full breadth of humanity's relationship with the cosmos -- from the earliest naked-eye observations to the engineering marvels of modern space missions.

Her books are built on a foundation of primary sources: peer-reviewed research, mission archives, and direct engagement with the scientific community. She writes for readers who want to understand not just what we know about the universe, but how we came to know it.

She believes that the most important frontier is not out there but in the gap between what scientists discover and what the public understands. Her books exist to close that gap.