Preface

In the first decade of the twenty-first century, observers of the night sky were able to watch the construction of the International Space Station in the sky above. A conspicuous, steady star would blaze across the dark sky from west to east, becoming ever brighter as new modules and cargoes were brought up until it outshone all the other objects in the heavens in what was humankind’s largest ever construction project.

From 2011, observers were able to spot a new, rival space station, the Tiangong, cross the sky. They could pick out the much smaller Shenzhou spacecraft as they chased Tiangong across the night skies to bring crews up to the station. Now planet Earth had two space stations: one belonging to the traditional big space powers; and one made in China.

The emergence of China as a spacefaring nation should, over the long course of history, be no surprise. Way back in what were sometimes called the Dark Ages in Europe, the rocket was invented in China. In the twentieth century, many of the engineering calculations necessary for rocket flight were done by one of the world’s great space designers, Tsien Hsue Shen. The Chinese space program was founded on 8th October 1956, a year before the first Sputnik was even launched. On that day, China’s political leadership decreed the foundation of the Fifth Academy to spearhead China’s space effort and requisitioned two abandoned sanatoria to be its first laboratories. Had it not been for subsequent political upheaval – the great leap forward and the cultural revolution – China might have achieved much more, much sooner.

As it was, China’s first satellite in orbit was the biggest of the superpowers. China was the third space power to recover its own satellites, put animals in orbit, and develop hydrogen-fuelled upper stages. China developed a broad program for Earth observations, navigation, communications, weather forecasting, and materials processing. China achieved space superpower status in 2003 when Yang Liwei flew into orbit. China overtook Europe in launchings per year and, in 2011, surpassed the United States.

The Chinese space program has sometimes been called the last of the secret space programs. Details of its early history still remain obscure. Writing about the early
Chinese space program is like trying to assemble a jigsaw where some of the pieces are not colored in and others are missing altogether. Even today, its facilities are still the least accessible of the space powers. In more recent times, China has become more forthcoming in detailing information on its current programs and future intentions.

Penetrating the fog enveloping some aspects of the Chinese space program is one problem. The level of Western misunderstanding of the program is a challenge of similar magnitude. With some honorable exceptions, many in the Western media who ought to know better responded to Chinese space developments with a mixture of puzzlement, patronizing down-putting, and dismissal. Chinese capabilities are often played down on the basis that their equipment is alternately primitive or imitative. If it works, the presumption is that it must have been stolen. There was, and remains, an extraordinary reluctance to concede to the Chinese the credit of having created, designed, and built their own equipment. This is a problem not peculiar to the space program, for the West often forgets how China pioneered so many things — from medicine to mathematics and public administration, as well as such inventions as the suspension bridge, paper-making, the compass, chemistry, printing, paper money, the stirrup, the plough, the lock gate, the wheelbarrow, and clockwork. The observations by the ancient Chinese astronomers are renowned for their accuracy.

This book is the third in a series. It was originally published as The Chinese Space Program – From Conception to Future Capabilities by Praxis/Wiley in 1998 and told the story of the program from its pre-history, through its first launch (1970), and its subsequent development in the 1980s and 1990s. The story was brought fully up to date, when Yang Liwei circled the Earth, as China's Space Program – From Conception to Manned Spaceflight (Praxis/Springer, 2004). This book begins with the construction of China’s space station, the Tiangong (Chapter 1), and is a detailed account of the contemporary Chinese space program. The earlier history is condensed into a single chapter (Chapter 2) and those interested in the detail of the early history should re-read the previous two books in the series. The subsequent chapters take the reader through the contemporary program: organization, infrastructure, and launchers (Chapter 3), recoverable satellites (Chapter 4), communications satellites (Chapter 5), applications satellites (Chapter 6) and space science (Chapter 7). Chapter 8 describes the manned spaceflight program, while Chapter 9 examines current Chinese exploration of the Moon and Mars. Finally, Chapter 10 looks at China’s ambitions in space, future programs, and their most likely lines of development.

Finally, a note on terminology. A complicating feature — one familiar to students of the Soviet space program — is the use of different designators for the same satellites. In the West, Chinese satellites were named China 1, 2, 3, and so on, also PRC-1, PRC-2 (People’s Republic of China), and even Mao 1, 2, and 3. At the time, the Chinese simply referred to these missions by their date of launch or in connection with political events. Eventually, the Chinese introduced a set of designators and applied them retrospectively. That should have been an end to the matter, but the Chinese then revised some of these designators several times over — and then
changed them again! Even to this day, different designators are applied to the same program. As if this were not complicated enough, inconsistent translations mean that many institutes, bodies, and organizations acquire, over time, slightly different names. Sometimes similar-sounding names turn out to be the same thing – but sometimes not. The Chinese also applied a series of numerical codes to their various space projects. Some were based on dates, others not. All this must be carefully disentangled. Here, the most consistent and most universally understandable systems have been used, but readers should be aware that others are also in use. We must also note that the Chinese have sometimes, though not always, followed the Soviet practice of not giving a number to the first satellite of a series. Finally, in the area of personal names, this book generally follows the Chinese practice of identifying people by their surname first.
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