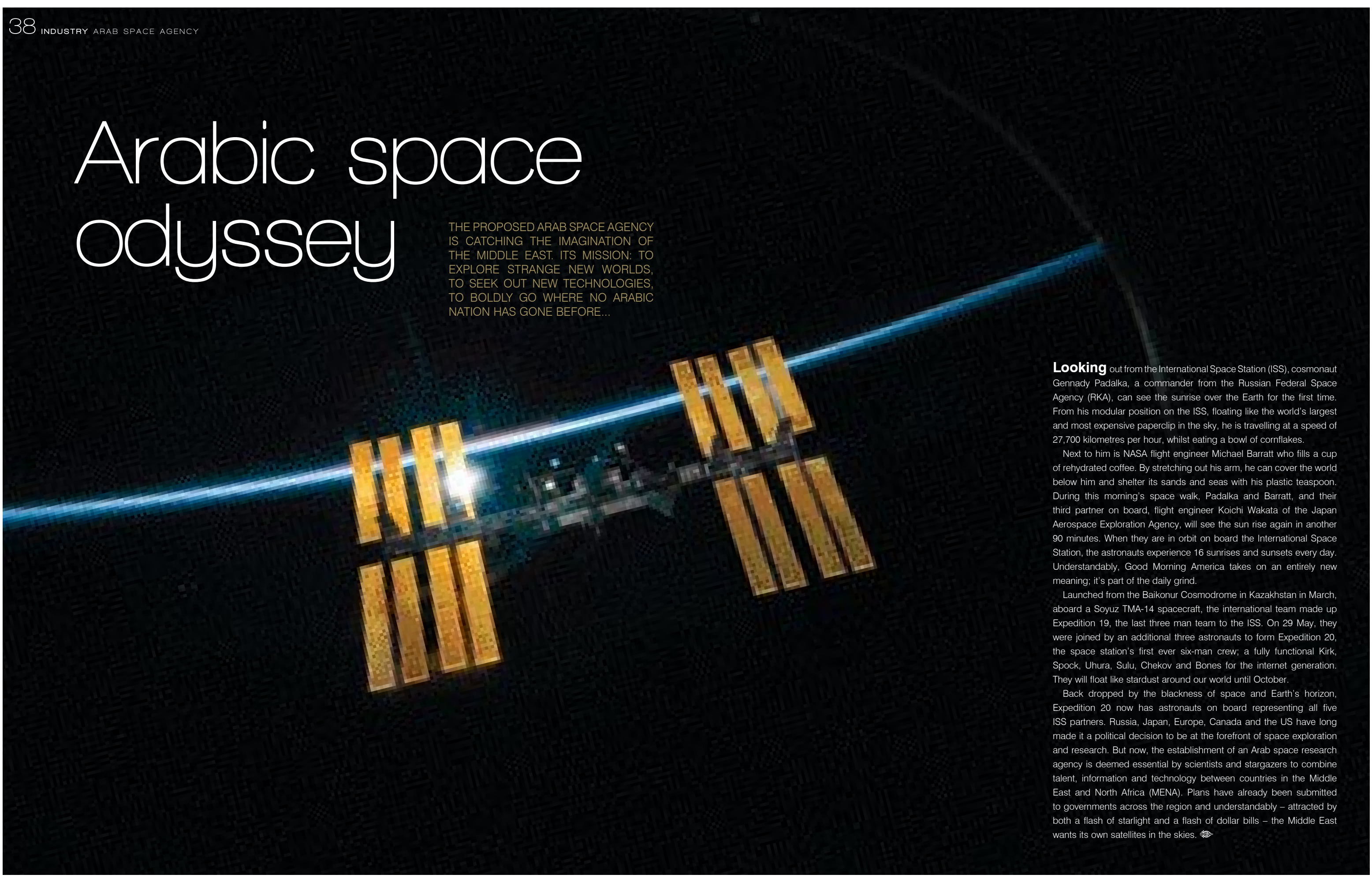


# Arabic space odyssey

THE PROPOSED ARAB SPACE AGENCY IS CATCHING THE IMAGINATION OF THE MIDDLE EAST. ITS MISSION: TO EXPLORE STRANGE NEW WORLDS, TO SEEK OUT NEW TECHNOLOGIES, TO BOLDLY GO WHERE NO ARABIC NATION HAS GONE BEFORE...

A satellite is shown in space, oriented diagonally from the bottom-left towards the top-right. It has two sets of solar panels, each consisting of four rectangular panels. A bright blue light trail follows the satellite's path across the dark background. The satellite's body is dark with some metallic components.

**Looking** out from the International Space Station (ISS), cosmonaut Gennady Padalka, a commander from the Russian Federal Space Agency (RKA), can see the sunrise over the Earth for the first time. From his modular position on the ISS, floating like the world's largest and most expensive paperclip in the sky, he is travelling at a speed of 27,700 kilometres per hour, whilst eating a bowl of cornflakes.

Next to him is NASA flight engineer Michael Barratt who fills a cup of rehydrated coffee. By stretching out his arm, he can cover the world below him and shelter its sands and seas with his plastic teaspoon. During this morning's space walk, Padalka and Barratt, and their third partner on board, flight engineer Koichi Wakata of the Japan Aerospace Exploration Agency, will see the sun rise again in another 90 minutes. When they are in orbit on board the International Space Station, the astronauts experience 16 sunrises and sunsets every day. Understandably, Good Morning America takes on an entirely new meaning; it's part of the daily grind.

Launched from the Baikonur Cosmodrome in Kazakhstan in March, aboard a Soyuz TMA-14 spacecraft, the international team made up Expedition 19, the last three man team to the ISS. On 29 May, they were joined by an additional three astronauts to form Expedition 20, the space station's first ever six-man crew; a fully functional Kirk, Spock, Uhura, Sulu, Chekov and Bones for the internet generation. They will float like stardust around our world until October.

Back dropped by the blackness of space and Earth's horizon, Expedition 20 now has astronauts on board representing all five ISS partners. Russia, Japan, Europe, Canada and the US have long made it a political decision to be at the forefront of space exploration and research. But now, the establishment of an Arab space research agency is deemed essential by scientists and stargazers to combine talent, information and technology between countries in the Middle East and North Africa (MENA). Plans have already been submitted to governments across the region and understandably – attracted by both a flash of starlight and a flash of dollar bills – the Middle East wants its own satellites in the skies. 🌌

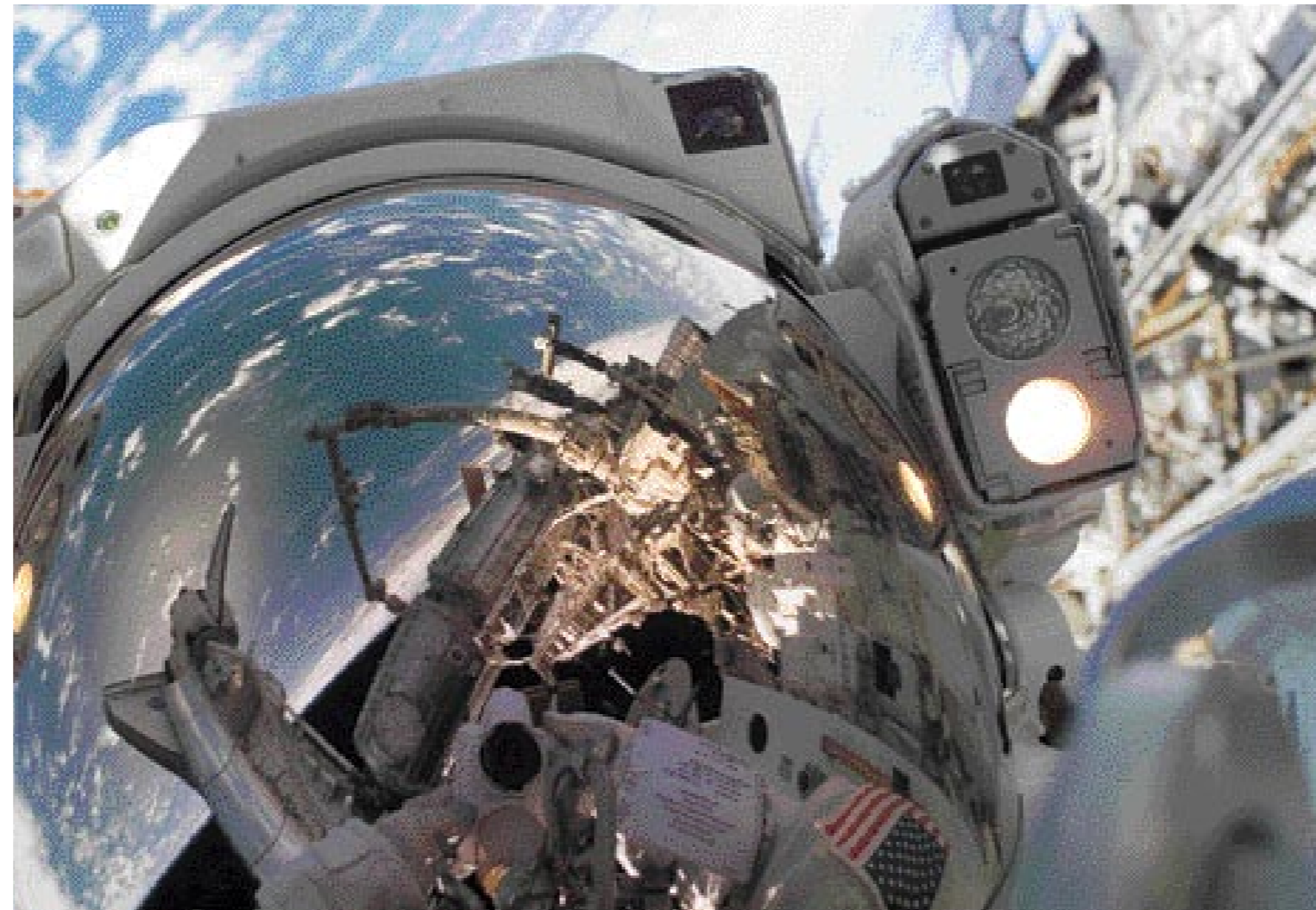
“The Middle East is looking for ways to modernise and move forward in this age of advanced technology, globalisation and competitiveness between nations,” explains Mohamed Argoun, professor of Aerospace Engineering at Cairo University and the former head of the Egyptian Space Program. “One formula is to focus on the space field. If you build satellites or launch them, it speaks volumes about a country’s industrial and scientific capabilities. But then countries discover that it isn’t easy – they have to build universities, improve education and spend money on research. It’s a long way to progress.”

But progress is being made. With an onus on regional governments to find viable economic models other than oil, space exploration and technology offer excellent opportunities for technology transfer. Today there are 20 emerging national space projects in the MENA region and recent investment is adding weight to the growing argument for the inception of an Arab Space Agency. Over the past two years, more than US\$5 billion has been announced in space and satellite projects in the UAE alone. To deny the facts would be illogical: the establishment of a pan regional agency would universally reduce the cost of sending satellites into orbit; explorers into space.

The region’s obsession with space discovery has long been known. Middle Eastern scholars looked skywards long before Neil Armstrong took a leap of faith for mankind and the Admiral Ackbar of American politics, Ronald Reagan, directed his cinematic Star Wars programme. And if there is any religion that invites man to study and understand the heavens, it is Islam – the crescent moon and star give a very obvious clue.



From 3000BC, the ancient Babylonians named the prominent constellations in the sky and long before the invention of the telescope, the sky-watchers of Mesopotamia identified the five original wandering stars. Even during the Islamic golden age, beady-eyed Arab astronomers predated the discoveries of Galileo and Copernicus by a good 500 years when their esteemed European counterparts were nothing more than stardust in their great, great, great, grandparents’ eyes. Turkish whizz-kid Muhammad Al-Battani determined the solar year as being 365 days, five hours, 46 minutes and 24 seconds – all without the use of a digital calculator – and Thabit ibn Qurra, from his bath-tub in Mesopotamia, published ground-breaking observations of the sun and the skies. As history demonstrates, astronomy is an Arabic science: a corpus of literature from Islamic astronomy, numbering more than 10,000 manuscripts, is scattered throughout libraries and universities worldwide, as spread out and uncategorised as the stars and solar systems themselves.



Previous page: the International Space Station Above, left to right: Apollo 12 catches an eclipse of the sun, Space Shuttle Endeavour in orbit, and extravehicular activity at the International Space Station

THE ESTABLISHMENT OF A PAN REGIONAL AGENCY WOULD REDUCE THE COST OF SENDING SATELLITES INTO ORBIT; EXPLORERS INTO SPACE

ANY SIGNIFICANT ASSAULT FOR AN ARAB SPACE AGENCY WOULD CONCEIVABLY TAKE A NOMINAL FIGURE OF BETWEEN US\$150 – 160 MILLION PER COUNTRY FOR ANY SERIOUS SATELLITE EFFORT

given a lower priority in a country during economic problems. However, today Arabic governments are only beginning to realise that even during economic hardships, the use of space technology is beneficial for overcoming these problems. Thus a mutual investment is needed if we wish to bring space and its resources under control and use that to reach our development goals. Establishment of a regional organisation devoted to space science and technology would not only bring technological advancements to the region, which positively affects the quality of life of its citizens, it would consequently be of financial benefit for regional countries.”

By looking at how much comparative space programmes spend on space research, it can be taken as a useful measure for the activity the Middle East should anticipate; South Korea spends US\$150 million per year, Spain US\$175 million and the Netherlands US\$160 million. Any significant assault for an Arab space agency would then conceivably take a nominal figure of US\$150 – 160 million per country for any serious satellite effort. Collectively this would be a US\$500 – 750 million per year spend from the Arab world for united technological and scientific space activity. Until now, it hasn’t been an entirely realistic proposition; but now the numbers and investments are beginning to add up.

In the Arab world there are five national satellite programs currently in operation. Morocco has its Zarkae Al Yamama satellite; the Algerian programme has AISat-1 and its proposed second segment AISat-2; Saudi Arabia has the Saudi-Sat programme, which includes two small satellites for communication and three somewhat larger remote sensing satellites; and then there is DubaiSat-1, the UAE’s first satellite built in cooperation with South Korea. The announcement by Abu

Away from such dusty yet enigmatic libraries, policy documents are now mounting in government halls as the region’s indigenous space administrations gather pace. A sizeable marketing campaign by the United Nations – promoting 2009 as the International Year of Astronomy – has added further support and kudos to the development of Middle Eastern projects. “One can justly argue that life without space technology is nearly impossible,” explains Ahmad Talebzadeh, chairman of the legal subcommittee for the United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS). “The countries that take advantage of the benefits of space technology are proven to have been able to speed up the rates of their development. This is not a far-reaching dream for Arabic countries – geographical boundaries lose meanings when it comes to space activities.” But as the MENA region is already so far behind NASA, RKA and ESA, investors would have the perfect right to ask: are they out of their Vulcan mind?

As the main players know – from Saudi Arabia’s King Abdulaziz Center for Science and Technology to the Iranian Space Agency – the key to success is money and tangible project development. “The development of space technology requires a lot of funding and cannot be fully accomplished by one country alone,” insists Talebzadeh, a former president of the Iranian Space Agency. “It wouldn’t come as a surprise if you hear that space activities are sidelined and

Dhabi based 4C GEOC for a US\$1 billion dollar Earth Observation Space Center, is further evidence that Arabic countries are now gearing up for the creation of a regional space agency.

Across the Red Sea, the Egyptian Space Program (ESP) is the fifth – but perhaps the most important – entrant on the space field. The success of its US\$21 million project EgyptSat-1, which launched two years ago, united a nation and advanced the training of 60 Egyptian scientists and engineers in all stages of satellite design, construction, and operation. EgyptSat-2, an improved version is planned to be launched in 2012, and plans are afoot for ESP to launch DesertSat, specialised in identifying and monitoring desert resources, by 2017. It seems that the Egyptians haven't forgotten what they learnt about the moon and stars from the Pharaohs.

"The Arab Space Agency is a must in the next phase of space development in the Arab World," says Mohamed Argoun, former manager of the EgyptSat-1 project. "We have several small national programmes, and each country has proved itself. But to proceed to a larger and more ambitious space programme, the Arab countries must come together in space under one umbrella and join resources. The resources of one country are not enough. Resources are not only financial, but also technical, managerial and in terms of infrastructure.

"There is also not yet the recognition and the drive that will let us get together," he concedes. "We are talking about it in meetings and forums at the moment – it seems that people recognise its benefits but there is not that decisive act that comes when there is the political will. I would say the investments allocated so far do not match the ambitions and goals that are envisaged for the region."

One remaining question, though, is who will take the initiative? The Saudis have a history of bringing the Arab countries together, yet the UAE has the entrepreneurial spirit and daring. The Egyptians have the significant technical capability and manpower but the Algerians and Moroccans will also want to get onboard. "Regional governments have been studying plans and more detailed proposals are being formulated," insists Nick Webb, organiser of the Global Space Technology Forum, a pan regional platform for the burgeoning MENA space industry. "With the UAE government already working hard to develop science and technology, the UAE could be seen as the logical venue for the agency's headquarters."

Analysts speculate that an Arab agency could follow the same footprint as the European Space Agency; where membership starts with space-active countries, and budget structures allow for large variations between member states – according to their participation – to suit their respective economies. Experts also foresee financial benefits and responsibilities being distributed so one country, for example, could take the initiative for communication systems, building this sector within its territory, while another country may concentrate on solar energy in space and its derivatives. It is pitched as a win-win situation for the entire region.

"SPACE PROJECTS ARE EXPENSIVE AND SLOW IN BRINGING RETURNS... NO ONE COUNTRY SHOULD CARRY THE BURDEN OF A HUGE PROJECT LIKE THIS."



A panoramic view of a mission specialist US astronaut installing handrails on the outside of the International Space Station in 2008

"Establishing an Arab Space Agency can come on more than one step," speculates Argoun. "It is clear that there is a great opportunity for Arab countries to also come together for building a second generation remote sensing satellite. Moving forward, a framework is needed that will require more coordination and the sharing of technical knowledge and resources between participants. With its inherent structure of close cooperation and the sharing of resources this project could almost be a blueprint for an Arab Space Agency. Because space projects are expensive and slow in bringing returns – in the short and medium terms it is advancement of science and technology – no one country should carry the burden of a huge project."

It is a promising theory, yet collaboration could still be a hurdle. Even in the ongoing ISS construction, which remains only 80 percent complete, the Americans and Russians are throwing the toys out of the pram like it was 1984 all over again. On 31 March 2009, Padalka raised an issue concerning shared use of facilities. Initial approval for the Russians to use exercise equipment owned by the US government was subsequently turned down. The crew have now been informed to use only their own toilets and not to share rations. It is as though Perestroika never happened.

The ISS may be a long way off for the Arab nations yet – 350 kilometres above the earth to be precise – but in a few years there may be cosmonauts from Saudi Arabia, Egypt or Iran, joining the likes of Padalka, Barratt and Wakata in reaching for the skies. An Arabic space odyssey surely beckons. ✚

WORDS Mike MacEacheran