

= Mir EO @-@ 19 =

Mir EO @-@ 19 (Russian : ??? ?? @-@ 19 , also known as Principal Expedition 19) was the nineteenth manned expedition to the space station Mir , lasting from June to September 1995 . The crew , consisting of Russian cosmonauts Anatoly Solovyev and Nikolai Budarin , launched on June 27 , 1995 aboard the Space Shuttle Atlantis on the STS @-@ 71 mission . After remaining aboard Mir for approximately 75 days , Solovyev and Budarin returned aboard the Soyuz TM @-@ 21 spacecraft on September 11 , 1995 .

EO @-@ 19 lasted just under three months and was the only complete all @-@ Russian crewed expedition to Mir in 1995 and was the first Mir expedition launched on an American Space Shuttle . The mission that launched EO @-@ 19 , STS @-@ 71 , was the first Space Shuttle docking to Mir .

= = Crew = =

Anatoly Solovyev served as a crew member on three spaceflights prior to EO @-@ 19 : Mir EP @-@ 2 , Soyuz TM @-@ 9 , and Soyuz TM @-@ 15 . This flight was his first aboard a Space Shuttle , with his three previous flights being on the Soyuz . EO @-@ 19 was the first spaceflight for Nikolai Budarin , who completed his cosmonaut training in 1991 and completed specialized training on the systems of Mir and the Soyuz @-@ TM spacecraft in 1993 .

Both spent just over 75 days in space during EO @-@ 19 and completed 1194 orbits of the Earth .

= = = Backup crew = = =

= = Mission highlights = =

= = = Crew launch and arrival = = =

The crew of Mir EO @-@ 19 launched aboard the Space Shuttle Atlantis on June 27 , 1995 as part of the STS @-@ 71 mission . STS @-@ 71 was the first docking of a Space Shuttle to the Mir space station and the first docking of an American and Russian spacecraft in 20 years .

STS @-@ 71 docked with Mir on June 29 and performed a crew exchange between the EO @-@ 19 and EO @-@ 18 crews aboard the space station . The crews of EO @-@ 18 , EO @-@ 19 , and STS @-@ 71 performed a ceremony inside Spacelab aboard Atlantis during which the ten crew members assembled a commemorative pewter medallion and exchanged gifts . Shortly thereafter , the crews began transferring supplies and tools to Mir from Atlantis .

On July 4 , The newly arrived crew of EO @-@ 19 undocked temporarily from the station aboard Soyuz TM @-@ 21 to observe and photograph the departure of the STS @-@ 71 and EO @-@ 18 crews aboard Atlantis . TM @-@ 21 undocked at 10 : 55 GMT , followed by STS @-@ 71 at 11 : 09 : 45 GMT . The EO @-@ 19 crew redocked aboard TM @-@ 21 at 11 : 39 GMT as Atlantis conducted a fly @-@ around of the station . Atlantis , carrying the crews of EO @-@ 18 and STS @-@ 71 , landed on July 7 after several more days in Earth orbit .

= = = Mission operations = = =

The crew of EO @-@ 19 conducted their first Extra @-@ vehicular activity , or spacewalk , on July 14 . Before the mission , the crew had trained to use special tools in order to release a stuck solar array on the exterior of the Spektr module . During the spacewalk , the pair cut a problematic restraint from the solar array . All but one section of the array deployed successfully . They then proceeded to inspect a docking mechanism in preparation for the relocation of the Kristall module . The final task of the spacewalk was to inspect a solar array on Kristall that was not tracking the Sun properly . The excursion ended after five hours and thirty @-@ four minutes outside the station .

The crew relocated the Kristall module to another docking port from the port intended for use by Progress M @-@ 28 on July 17 using its Lyappa manipulator arm . This operation was performed in preparation for the next docking of Space Shuttle Atlantis to the station on the STS @-@ 74 mission later in the year .

During the mission 's second spacewalk on July 19 , the crew were to deploy a 220 kg (490 lb) Belgian @-@ French spectrometer , named MIRAS (Mir infrared spectrometer) on the Spektr module . Following a malfunction in Anatoly Solovyev 's Orlan space suit minutes into the excursion , mission control directed him to remain attached to the Kvant @-@ 2 module via umbilical cable . Despite this setback , Nikolai Budarin was able to perform several tasks alone , including preparatory work for the installment of MIRAS and retrieval of an American cosmic ray detector , TREK . The crew returned to the airlock after three hours and eight minutes . Upon returning to the airlock , the crew discovered a 2 mm (0 @-@ 079 in) gap in the seal , which created difficulty in sealing the hatch .

July 20 saw the launch of the Progress M @-@ 28 resupply ship to the station , which docked on July 22 . The Progress @-@ M spacecraft remained docked to the station until September 4 , when it undocked from Mir filled with waste and excess equipment and intentionally burned up on reentry .

During the mission 's third and final spacewalk on July 21 , the two cosmonauts made a second attempt at installing the MIRAS spectrometer , which they completed without any major problems . The spacewalk lasted five hours and thirty @-@ five minutes .

During the later part of their mission in August , the crew focused on completing experiments and doing research in the areas of astrophysics , life sciences , and smelting . The remainder of the crew 's activities during this time consisted of unloading the newly arrived Progress cargo ship and monitoring its automated refueling of the station 's core module .

= = = End of mission and crew departure = = =

The Mir EO @-@ 20 crew consisting of cosmonauts Yuri Gidzenko and Sergei Avdeyev , as well as ESA astronaut Thomas Reiter conducting Euromir ' 95 , launched on September 3 at 9 : 00 GMT aboard Soyuz TM @-@ 22 . The crew of EO @-@ 20 docked with the station on September 5 at 10 : 29 : 54 GMT , with hatch opening occurring at 11 : 01 : 23 .

After transferring command of Mir to EO @-@ 20 , the crew of EO @-@ 19 boarded the Soyuz TM @-@ 21 spacecraft , which arrived with the crew of Mir EO @-@ 18 in March 1995 , on September 11 and undocked from the Kvant @-@ 1 module at 3 : 30 : 44 GMT . Soyuz TM @-@ 21 , along with cosmonauts Solovyev and Budarin , subsequently landed at 6 : 52 : 40 GMT about 108 km (67 mi) Northeast of Arkalyk , Kazakhstan .