as short as 5 mm. It will be used primarily for VLBI down to 7 mm wavelength but will have a single-dish spectroscopic capability for observations of interstellar oxygen. The O_2 lines near 60 GHz are of course not observable from the ground because of the severe absorption by atmospheric oxygen. In its present concept, IVS will have an ESA payload launched by the Soviet Energia rocket and will involve NASA tracking stations.

Current Space VLBI observations, of course, rely on the ground networks as well as the space antennas and since the space element orbits the earth, they become truly international employing ground-based telescopes in all continents. Negotiations are currently underway between the ground organizations and the space agencies. With the experience of cooperation in VLBI already gained, we can expect very successful results in the future.

Well into the 21st century, when space VLBI is established, we may see arrays of telescopes in space providing resolutions as fine as 1 microarcsecond. Perhaps it will be possible to measure quasar proper motions!

5. Epilogue

I have already mentioned the grave problems caused in radio astronomy by man-made interference. In many ways this is not surprising because of the extremely small signals received by radio astronomers (the unit of flux density is 10^{-26} watts Hz^{-1} m^{-2}) and the proliferation of communications equipment. At the World Administrative Radio Conference (WARC) where the frequency bands of the spectrum are allocated to the various services, radio astronomers have to fight hard to keep their precious observing bands. This is because commercial and military users are always demanding more and more channels – sometimes for reasons which can hardly be judged to be important. The situation is becoming so critical in some parts of the spectrum (e.g. near 18 cm wavelength), that suggestions to put radio telescopes on the far side of the moon are being taken seriously.

Radio astronomy is vital to our understanding of the universe and must not be squeezed out of existence by commercial demands. We appeal to our scientific colleagues in other disciplines to help expunge the harmful pollution of the spectrum.

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Infrared/Sub-mm Astronomy After ISO (1 μm-0.3 mm)

ISO:	2-200 μm photometry, imaging + moderate resolution spectroscopy at excellent sensitivity
POST-ISO:	High spatial resolution: 1″ at 100 μm → D = 10 m 8 m at 2 μm = 0″.05 for single dish 100 m at 2 μm = 4×10^{-3}″ for Interferometry λ>200 μm: colder universe at sub-mm wavelengths High spectral resolution: velocity resolved spectra
PLATFORMS:	VLT+VLT Interferometry (λ ≤ 30 μm, λ ≥ 300 m) Large Airborne Telescope (SOFIA; 2.5 m, visible → 1 mm) Large IR/sub-mm telescope in space (FIRST, SM^3/LDR λ = 50 → 1000 μm EDISON λ = 2 → 100 μm) Antarctica: ground-based FIR astronomy from Antarctic plateau (e.g. Vostock Station)
INSTRUMENTATION:	Large format, low-noise detector arrays for ground-based (λ = 1 → 30 μm) and space-borne (30 → 300 μm) work Quantum noise limited sub-mm heterodyne receivers
Summary by R. GENZEL, Max-Planck-Institut für Extraterrestrische Physik, Garching bei München, Germany	

Post-VLT Optics and Telescopes

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I would like, in this brief introduction, to stimulate some thoughts and discussion on what the principal directions of optical telescope development will be after the year A.D. 2000.

Ground-based-telescopes will, I believe, continue to play a major role because of recent optics and electronics developments and the cost advantages that accrue from them. *Space telescopes* will slowly gain in total reflecting area and hence in importance, the rate depending on cost, reliability and increased maintenance and user-friendliness.

1. Ground-Based Telescopes

Throughout its long development after the first manufacture about 1665, the evolution of the reflecting telescope has