FREDRICK: Shortly after the telescope goes up, there will be an announcement of opportunity, and if you want to use the Wide Field/Planetary Camera to look at double stars and can justify it, you'll get to look at double stars. But, don't forget that NASA sold this on rediscovering the universe.

RAKOS: The Space Telescope will be capable of observing double stars, to see very faint companions very close to the main star, but the proper time to observe all these stars is a large fraction of the time that the telescope can be used, and I don't think astrometric purposes will have a very high priority. It depends on the community pushing together, and there is a need to stress that quality astrometric measures are as needed as any other measurements that we can do with the telescope; I don't think the whole astronomical community believes this.

BAUM: Let me follow that up by saying that our team, to the extent that it can plan the science done during those early months, does not have some strong parochial view that something is good because it's astrometry, or something should be rejected because it's astrometry or any other particular field of astronomy. The point is that you should do those things from which you will learn some fundamental astrophysical or cosmological information. You want to learn about the origin and evolution of the universe or some part of the universe; you wouldn't measure something to get an extra decimal place because it would be cute. So, the rationale in choosing whether to observe certain things or not observe certain things, apart from instrument capabilities, will hinge on whether or not it gets at important problems in understanding the universe.

The Space Telescope Wide Field/Planetary Camera team also examined the possibility of detecting extra-solar planets by direct imaging. Even if we were to add a coronagraphic mask, in addition to the focal plane dead spot, it was our opinion that direct image detection was not likely enough to succeed for us to base our search for extra-solar planets on this method. Rather, we opted to use the astrometric approach. Can you really do better with the ST Faint Object Camera, and will you not have even more severe problems with reference star selection with your 22" by 22" field of view?

There is also the question of the status of the fine-guidance instrument, which is currently undergoining a major redesign and for which the transfer function will probably come out very different. Is there some updated information on that?

RAKOS: The field of view of the Faint Object Camera is of course very small, but it is not proposed to do astrometry to look for Jupiter-like planets, but to do direct imaging.

*FREDRICK: The FGS has gone through several major redesigns in the last several years, and they have always hedged on the engineering model. There is to be a major evaluation, and the indication is that they are going to change the design of the thing.

*BAUM: The problem was that, if the jitter of the telescope were to exceed 0".02 after it had locked on, the system as designed would lose the star. It was my understanding that a major change in the nature of the detector was being planned, so that you could get a different kind of transfer function. It appeared to be vital just so the Space Telescope would work, let alone do the astrometry that has been discussed.

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*FREDRICK: I think the jitter problem was overcome in the design of approximately a year ago, but it is my understanding that the prism detector package is now the problem.

*CURRIE: There are questions having to do with the prism package, but an aspect of what Baum is saying is still a major concern. For faint stars, the photon noise and attending system noise appear likely to push the system over the top of the curve, and in that case you lose most of your error correction. There is an obvious solution, and that is that you no longer look at 14.5 magnitude stars, but only look at 13. The difficulty with that is that you remove major areas of the polar region from where ST can work.

DOMMANGET: My feeling is that, especially with Hipparcos, visual binary stars are always considered as poor parents, and proposals for binary observations are generally considered with less care. We must keep in mind that, in the case of Hipparcos, this situation may be worse, because only a few stars -say, five to seven - will be observable in each square degree. If one considers that stars only up to tenth magnitude will be observed by Hipparcos, there will be some competition between objects of different nature. Of course first of all, stars must be chosen for the astrometric catalog. Therefore, it will not be in our interest to propose a program of several dozens of thousands of stars that will certainly be refused. We must make a choice and ultimately organize ourselves - perhaps on the level of the commission - to see what kinds of stars should be proposed.

WESTERHOUT: One of the important conditions for getting a project approved for Space Telescope should be that it can not be done from the ground. In today's session I have heard nothing in the field of binary star astronomy proposed for ST or Hipparcos that can not be done from the ground in the next five years on an experimental basis and in the next ten years on a regular, routine basis. Therefore, the binary star community should continue to push strongly for funding of the new ground-based experiments that have been so excellently discussed in the last few days, not only in support of ST and Hipparcos, but also to relieve these space missions from an unnecessary burden.

POPPER: Do I understand you to say that one or two milli-arc-second parallaxes can be done from the ground?

WESTERHOUT: It has been shown that the USNO 61-inch reflector can reach 1 m.a.s., and we plan to routinely produce such accuracies within the next five years. The difference between USNO and ST and Hipparcos is quantity. USNO produces perhaps 75 parallaxes per year, ST might do 10 to 20 over five years. Hipparcos, on the other hand, proposes to have 100,000 parallaxes in ten years.

STRAND: If at all, these 100,000 parallaxes, good to 2 m.a.s. (not 1 m.a.s.) will not be available for another 19 years - launch in 1987, data available in 1990, and data reduction takes ten years after that.

WESTERHOUT: It is therefore completely obvious that improvement of ground-based techniques is imperative if we don't want to stagnate for 20 years. It should also be mentioned that it appears possible in principle, using specially built telescopes, to reach 0.1 m.a.s. relative positional accuracies from the ground. The reader is referred to chapter 6, "Astrometry", in the volume

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"Challenges to Astronomy and Astrophysics", accompanying the U. S. National Academy of Science report on Astronomy for the 1980's.

DOMMANGET: It should be emphasized that Hipparcos and ST lead to more ground-based observations. First of all, for each binary that will have to be observed by Hipparcos, one will need the B and V magnitudes, as well as the difference in magnitude, in order to locate beforehand the photocenter in the Hipparcos system. Further, all astrometric information one can get from Hipparcos for binaries will see their interest for further research increased if astrophysical parameters are determined for them, as for instance, radial velocities and spectra.

*Footnote by FREDRICK: The Space Telescope Project Scientist says this part of the discussion is now out of date.

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