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Michelson-Morley in space FRED PIERCE — An experiment is proposed in which a Michelson-Morley interferometer is placed on a space station whose rotation is generating an "artificial gravity" field. The two horizontal arms of the interferometer are placed parallel to the rim of the space station whose motion generates the gravitational field; a vertical arm is added perpendicular to the direction of motion – facing towards the center. The nature of the field created by the rotation of a space station lends itself to analysis by the interferometer in two-dimensional cross sections. It is predicted that there will be no interference fringes between the forward and backward facing arms when the space station is in constant motion but there will be an interference fringe with the vertical arm juxtaposed to the horizontal arms. The rotation of the space station is then accelerated. During the acceleration, there will be a difference in the interference fringes between the forward arm and the backward arm. When the motion of the greater rotation is brought to a constant spin at a higher velocity – a "frame of reference" with a higher spin – there will be a stronger gravitational field. The horizontal arms are predicted to, once again, have no evidence of interference fringe differences between them (as the motion is balanced) but the vertical arm will evidence a stronger interference fringe difference in this "frame of reference" than the previous frame of reference. Such a vertical arm in space suggests a new Michelson-Morley experiment on earth with a vertical arm added to the two horizontal arms.

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