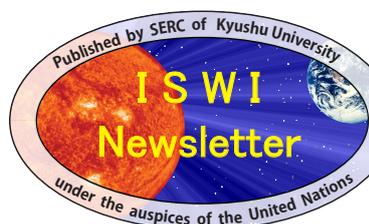


Padre Faura's Notebook Reflections from the Manila Observatory's Ionosphere Building

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Spectroheliograph at Manila Observatory: Miller and Hennessey

Posted June 6, 2009 by Quirino M. Sugon Jr in [Uncategorized](#). Tagged: [Charles E. Deppermann SJ](#), [James J. Hennessey SJ](#), [Manila Observatory](#), [spectroheliograph](#). [3 Comments](#)

The spectroheliograph at the Manila Observatory is not anymore used. It is housed in another building, a few meters from here. It was used before to study sunspots. I think it would be a good idea to revive the spectroheliograph, in connection with the ionospheric work and climate change.

I downloaded pdf copies of two journal articles on the spectroheliograph in its glorious days:

[1] Richard A. Miller, "New spectroheliograph at Manila Observatory," *Applied Optics* **4** (9), 1085-1087 (1965). [\[Abstract\]](#)

[2] J. J. Hennessey, "Solar work at the Manila Observatory," *Solar Physics* **9**, 496-501 (1969). [\[front page\]](#)

Here is a description of the spectroheliograph by Hennessey (1969, pp. 497-498):

In 1963 the first major solar instrument put in operation at this site was the vacuum spectroheliograph. This was specially designed for Manila. A pair of 16-inch coelostat mirrors directs sunlight to the 12-inch objective mirror of an off-axis Gregorian system with a choice of either an 8-inch or a 3-inch secondary mirror. All optics are of fused quartz. The entrance slit of the vacuum tank serves a dual function. Part of the light beam is reflected to a Halle Lyot-type filter. This passes only H α light needed for the visual patrol and for photography. Secondly, the light beam entering the slit passes to an off-axis 11-inch parabolic mirror at the bottom of the 17-foot vacuum tank, then to the Bausch and Lomb replica diffraction grating. From the six-by-eight-inch grating with 15 000 lines to the inch, the selected spectral light is reflected down the tank to a second off-axis 11-inch parabolic mirror and thence to the exit slit at the top of the tank. The seals at the entrance and exit slits are similar field lenses. This system can be used either as a spectroheliograph or as a spectrograph. In daily routine use hydrogen and calcium spectroheliograms are taken. The Halle filter serves well for the monitoring of solar features.

All controls for the automatic operation of the various parts of the instrument are near at hand for the observer. The building, too, is designed to present the optimum environment for the operation of this equipment (Figure 2). The Observatory acknowledges the assistance of the U.S. NASA under Grant NsG-288-63 for part of the cost of this spectroheliograph.

Here is that of Miller (1965, p. 1085)

A combination solar spectroheliograph and spectrograph, newly installed in the Philippines at 8-h East longitude is described. The rotatable vacuum spectrograph follows an Ebert design, consisting of a plane grating and two mirrors. These off-axis mirrors are figured sections of one single mirror form and function as collimating and camera mirrors. The spectrograph system matches the f/24 Gregorian-type telescopic quartz mirror system of 30.5-cm clear aperture, fed by 41-cm coelostat mirrors. The grating drive is wholly within the tank. Spectroheliograph scans are with fixed slits but with a moving image and moving plate or filmholder. Slit jaws are of stainless steel and form slits 76 mm long. Dispersion is 2.75 Å/mm in the first order. An 8.3-cm X 10.8-cm plateholder receives the spectrogram or spectroheliogram image. Visual monitoring and 35-mm photographs of the solar image at the entrance slit are made through an Ha Halle monochromator. A typical spectrogram and spectroheliogram are shown.

Some historical trivia:

James J. Hennessey, S.J. (1909-1987) joined the Manila Observatory 1951 and succeeded Charles E. Deppermann (1889-1957) as director in 1957.

Richard A. Miller (1917-1974) came to the Observatory in 1957. He studied at Fordham University and University of Michigan.

Source:

Agustín Udías Vallina, Agustín Udías, [Searching the heavens and the earth: the history of Jesuit observatories](#) (Springer, 2003), p. 156.

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Posted by Paolo Cauton on [September 16, 2009 at 2:58 pm](#)

Sir,

I'm quite affected, to say the least, that "The spectroheliograph at the Manila Observatory is not anymore used."

Back in 1994-1995, I was part of a very small team that worked to put it back together again. There was I and Jonas Domingo from AdMU PhysicsCE 95, and Cio who was an upper class man from Chemistry. We were under the guidance of Fr. Dan McNamara S.J.

It was actually the 2nd in the list of my possible thesis subjects suggested by Fr. Dan, the first one being "Ocean Thermal Energy Conversion."

Most of the piecing things together was done by Cio, it was almost done by the time I and Jonas got on board

to do its calibration as part of our thesis. From what I understand, the splitter mirrors were new then and different from the original specs thus needing to recalibrate. It was very memorable and tiring moment because we have to do the work at night. Even the thermal printers used to take images of the Sun in various wavelengths was also tested and functioning.

Further work was done on the specroheliograph by batch 96 which replaced the aging 2-phase motors as well as computer controls.

I guess it needs a good experiment again to bring back its former glory. It will be good to have it in tip-top shape by 2012 in time for the Venus transit.

Just my thoughts,
Paolo Cauton
A/S PsCE 95

[Reply](#)



Posted by Quirino M. Sugon Jr on [September 17, 2009 at 9:54 am](#)

Hi Paolo, if I remember right, you are physics senior when I was in freshman at Ateneo, but I may be mistaken. I studied physics at the Ateneo from 1992-1997. I used to hang out at the ASG (Atene Science Guild) in Colayco (now replaced by Manny V. Pangilinan building). My friends call me 'Pope'.

The Physics and the ECCE became separate departments. There is no more Ps CE, only Ps-ACS (Applied computer systems). CE is now a separate course offered by ECCE. We used to have at most 20 students per batch during our times. Now, i think it is lower for physics, even combining ACS and Materials Science tracks. And Fr. Dan is now assigned in Ateneo de Davao, though he goes here once a month. Being a theoretician, fixing the spectroheliograph is not my expertise. Maybe i have to ask for DOST funding.

[Reply](#)



Posted by Paolo on [January 11, 2010 at 11:27 am](#)

It would be good to have it up and running again before 2012 in time for the last 21st century transit of Venus (June 5-6). Next transit will be in the year 2117.

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Fr. Federico Faura, S.J.



June 2009

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