

CHANT MEDAL ACCEPTANCE SPEECH

Ed Majden



I would like to thank the RASC for recognizing my long term involvement in meteor spectroscopy and awarding me the C. A. Chant Medal. This was indeed unexpected and a very pleasant surprise. I do hope I can live up to the standards of this award set by previous recipients. I must apologize for not being able to attend the GA in person, health problems.

My interest in astronomy began when I became a member of the Regina Astronomical Society as a very young student, back in 1953 if I recall correctly. The RAS was very active conducting visual meteor observations at this time in support of Peter Millman's meteor programs. Great fun counting meteors, estimating magnitudes, and shower associations. At this time the RAS was also building a very nice domed observatory for a 4 inch Brashear refractor. The observatory was completed in 1955 and Peter Millman presided at the official opening. This is when I met Peter and after many years we became good friends.

The guiding light of the RAS was the late John V. Hodges, later director of the RAS Observatory. John had an objective prism that he used on an old tourist camera to try and obtain meteor spectra. As luck would have it, the first success came during the Perseid Shower in 1955. This was recorded as Spectrum Number 187 on Peter Millman's World List of Meteor Spectra. The second success came the following year 1956, recording Spectrum Number 201 on the World List. At this time meteor spectra were few in number so any spectrum was considered important. Canada was a major contributor to the World List during this period under the directorships of Peter Millman and Ian Halliday. This is when the bug hit me. As secretary of the RAS in 1956 I helped organize a Province wide meteor observation program called Operation Perseid which was reported in the JRASC. We had several stations set up across the Province all connected by amateur radio. I was also the RAS Meteor Reporter for I.G.Y. in 1957/58. John adapted his prism so it would fit an old Olympus camera that I owned. I tried in vain to capture a spectrum with this set up but was sadly unsuccessful. My technique was correct but it is not easy to record a

spectrum since the setup was only sensitive to meteors brighter than minus magnitude 2 and brighter. I still kept trying!

After high school I enlisted in the RCAF and was trained as, what was then called an Armament Systems Tech, later called Radar Systems. I became an armchair astronomer at this time because of service commitments and frequent moves etc. My interest in meteor spectroscopy peaked again when I read a paper by Professor John A. Russell in *Sky & Telescope* in 1969. He was using a surplus F-2.5 Kodak Aero Ektar Lens fitted with an objective prism to record meteor spectra, He was especially interested in the Auroral Green Line of OI at 5577A that was first identified by Ian Halliday in 1958. I decide to try and find an objective prism by placing a wanted ad in *Sky & Telescope*. In due course I was contacted by an individual that said he had a large prism that should work. When it arrived, it was not exactly what I was looking for. It was a large surplus 60 degree prism of very dense flint glass of questionable quality. I mentioned this to Peter Millman and he suggested I have the prism cut into two 30 degree prisms and then rework the surfaces to 1/10 wave. Not having the capability to do this myself Peter found an optical firm in Ottawa that could do this at a reasonable cost. I mounted one of the prisms on an old 4X5 Crown Graphic fitted with an Aero Ektar lens and successfully recorded two Perseid Spectra in 1972. Finally a success!

At this time I was corresponding with Ken Chilton, the then General Secretary of the now defunct I.U.A.A., International Union of Amateur Astronomers. He suggested that I try and get others interested in meteor spectroscopy and put me in contact with Karl Simmons from the American Meteor Society and publisher of their newsletter *Meteor News*. I wrote a paper on the methods and also reported my successes. Unfortunately there were few takers as most did not want to spend the money on an objective prism or the more preferred precision blazed transmission grating. After the demise of the I.U.A.A. I was contacted again by the American Meteor Society to set up a similar program for them. This has also met with limited success but I still keep trying.

Back in the late 1960's and early 1970's I read about the efforts to record the spectra of fainter meteors. Gale A. Harvey from NASA/LRC had some large aperture very fast Maksutov spectrographs deployed and he recorded a large number of meteor spectra to about magnitude +3.0 or so. Also at this time A. F. Cook, Peter Millman and others were experimenting with Low Light Level TV techniques to record fainter spectra. A very interesting advancement in this field but too expensive for amateurs in my income bracket. Later image intensifiers were developed for the military for

night vision purposes. Surplus 2nd Generation Intensifiers hit the surplus market and some meteor types were using these for astronomical purposes, i.e. recording faint meteor trails. I considered this and then thought, why not mount a transmission grating on one to record meteor spectra. Some professionals were already doing this. I picked up a surplus 2nd Generation Intensifier that was classed experimental grade from an American surplus firm for \$199. I put together an experimental set up using a fast 35mm camera lens, a transmission grating and a video camera to record the images on VHS tapes. Success came when I started recording Perseid spectra with this set up in 1999. I did a short presentation on this at a MIAC meeting in Edmonton. Actually this was rather amusing. I did not shield the green glow of the image intensifier screen and this attracted night time insects. At the presentation I told the MIAC members to keep close watch for a UFO which I referred to as a UFB. A little creature appeared walking across the video screen and very conveniently got out of the way as a Perseid spectrum was recorded. Jeremy Tatum identified the UFB as an earwig and everyone had a good laugh. Bob Hawkes asked for a copy of the tape so he could present it to his students. This system recorded spectra to about magnitude +3 or so. I used it for the 2001 Leonid Storm and recorded 110 meteors with this system, 60 zero order images and 50 first order spectra. These are now in Peter Jenniskens's NASA/SETI archive which I hope will be useful in the future. Jiri Borovicka from the Czech Academy of Sciences and Ondrejov Observatory measured one of these spectra and it is posted on my web page.

I have also experimented with the use of inexpensive thin film holographic gratings in order to lessen the cost of doing meteor spectroscopy. This was reported in the JRASC. The value of using these inexpensive gratings is still questionable, as they are not as efficient as a precision blazed replica grating and the photometry is not established at this time.

So far I have recorded 17 meteors of varying quality with my film based spectrographs. My best one, secured in 1986 was published in the JRASC as a joint paper with Jiri Borovicka.

I hope to continue doing this as long as I can. Each year, it is becoming more difficult to do from my backyard observatory because of light pollution etc but I still think it is worth doing and I will continue as long as it remains fun and is useful in a minor way to the science of meteoritics.

I thank you again for presenting me with the Chant Medal.

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