



IMS: Opening Moves

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From left: Professor Louis Chen, Professor Shih Choon Fong, RAdm Teo Chee Hean

Not long ago, mathematics was commonly regarded by the general public as a reclusive activity pursued relentlessly and obsessively by a small number of individuals within the cloisters of universities. Mathematicians then seemed to be detached from and unperturbed by the fervent activities of their scientific counterparts who were busily establishing bigger and bigger research centres and research institutes during the political rivalry of the cold war and the ensuing technological competition of the post-Sputnik era. After all, mathematics has always been a low capital, low risk but high yield enterprise. Until recently, few mathematicians since Newton have asked for more than a copious supply of paper and pencil. Even the computers which they occasionally used to extend the computing power of their brains did not cost half as much as the gadgets and machines of their scientific colleagues. There seemed to be no good reason why mathematics or mathematicians needed institutes.

All this changed when dedicated institutes were established in Europe and the United States according to customized needs and succeeded in drawing in both talent and funds. Scientific breakthroughs were routinely reported from these institutes, attracting even more grants and talent, which, in turn, churned out more results, and so on ... The technological, if not scientific, revolution began to revolve around these institutes. Although mathematicians were sometimes roped in for specific tasks, the agenda were not theirs. Yet it was relatively recent that mathematicians started to set up their own research institutes and chart their own directions for research in specialized areas and across disciplines. Directors of these

institutes are ever mindful of the need to return to the sources of origin of mathematical ideas in the real and physical world and of the importance of the servicing role of mathematics in other disciplines and in society.

As the Director, Prof Louis Chen, revealed in his welcome speech at the opening ceremony of NUS's Institute for Mathematical Sciences (IMS), the genesis and birth of the Institute had its share of vicissitudes. Even as heads retired and deans changed, the originators and prime movers did not lose hope. And after several resuscitation attempts, an almost still born idea was finally brought to life with a vigour that belied a long incubation. The route from inception to materialization took three submissions of proposal over a period of ten years. He could only conclude that it is only now that the time is ripe for fruition with the presence of the following three ingredients: (1) the development of

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three closely related departments (Department of Mathematics, Department of Statistics and Applied Probability, Department of Computational Science), (2) the new NUS mission and (3) the national push for a knowledge-based economy.

When approval to set up IMS was finally given by the Ministry of Education, Prof Chen personally picked two old University-owned bungalows at Prince George's Park within a stone's throw away from the technological hub of the Science Park. He oversaw the renovation and transformation of the two modest-looking buildings into what he hoped would be "a resort-like haven for research" within a peaceful, if not idyllic, environment.

The day of the Institute's official opening on 17 July 2001 began with bright sunshine that lasted until shortly after noon. When the guests have all taken leave of the reception at the lounge and after the journalists have fielded all their questions at the press conference that followed, the sky opened up with thunder and showers only to regain its composure just before a special lecture (in some sense, the Institute's inaugural lecture) was given by Professor Jean-Pierre Serre, who was on a three-week visit to the Institute and the Department of Mathematics (his fifth to the Department). One is tempted to believe that all should be well that begins well.

The approximately one-hour opening ceremony at the auditorium of the Institute of Molecular Agrobiolgy, which is about 5 minutes' walk away from IMS, was attended by about 100 guests. About half of them were visitors to the Institute or participants of the first workshop of the inaugural program which had started the day before. About 40 came from NUS. The fact that more than half of the guests were not from NUS seemed to underline the Institute's objective of multi-disciplinary collaboration between researchers within NUS and without.

The three official speeches delivered may have offered some sobering thoughts, but by and large, the atmosphere throughout the ceremony was one of congeniality, informality and optimism. The ceremony ended with two short musical performances which reiterated the message that the spirit and substance of mathematics is cross-cultural in both the intellectual and sociological sense. The first was a rendition on four recorders by the Pipers' Guild @ NUS, (an early music ensemble from NUS's Centre for the Arts) of J.S. Bach's "Fuga Alla Breve"- a piece that is as mathematical as it is occidental. The second was a performance on the guzheng (a traditional Chinese musical instrument that has its origins in the Middle East) by a young and talented Singaporean musician, Miss Lim Choo Li, of a piece titled "Xue shan chun xiao" ("Spring Morning on Snow Mountain") and which is as lyrical as it is oriental.

The welcome speech by Prof Chen outlined the chasing of a collective dream that lead to the birth of IMS and the projection of a vision for research collaboration across disciplinary, organisational and physical borders. His slide presentation of the Institute's buildings and premises was not unlike that of a proud owner of a new home. The only regret he expressed was the recent demise of a friend and founding member of the Institute's international Scientific Advisory Board - Prof Jacques-Louis Lions of the French Academy of Science, who had helped in charting the direction of the Institute in its embryonic stage. Other members of the Board who were present were Professors Chong Chi Tat, Roger Howe (Yale), Lui Pao Chuen (Singapore's Chief Defence Scientist) and David Siegmund (Stanford) while the following three members were unable to come: Hans Fllmer (Humboldt-University of Berlin), Avner Friedman (Minnesota) and Keith Moffat (Cambridge).

In his speech as Chairman of the Scientific Advsiory Board, Prof Howe described the setting

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up of IMS as an “inevitable and audacious” move. Indeed, even with the optimism generated by Singapore’s unrelenting drive in the new information age and by the impressive track record of abstract mathematics begetting useful tools, there is a need, if not urgency, for the Institute to maintain strong links with the physical world and the human domain. An even more sobering thought was raised when Prof Howe made a comparison of the mathematical resources in United States and Singapore. Most mortals would be daunted by such a numbers game. But then, much of history is a record of the overcoming of such odds.

IMS was officially declared open by the unveiling of a plaque by the guest-of-honour RAdm Teo Chee Hean, Minister for Education, at the end of a speech which gave the audience a humorous glimpse of his university experience with mathematics and mathematicians at Imperial College in London. It is not often that the Minister deviated from his prepared speech. This informality undoubtedly added to the congeniality of the occasion. He recalled how, when confronted with a problem in another field, mathematicians would invariably make a link with some general mathematical theory and consider its solution as a special case at best and “trivial” at worst.

Of course, there is no denying the power of general mathematical theories in reducing many problems in other fields to “special or trivial cases”. But the point is that the over-confidence (hopefully not arrogance) that can be generated by the mathematician being consulted may not be conducive towards a dialogue between two different “cultures”. Do we want scientists to reinvent the mathematical wheel or, more sensibly, to seek out those mathematicians who are receptive to more down-to-earth problems? Will this species of

mathematicians become an endangered one given that mathematicians are generally known to be fiercely independent and highly idiosyncratic. And it does not help either to know that the pinnacle of excellence in mathematics has never been measured in terms of successes in applications to disciplines outside mathematics. If mathematicians working in scientific research institutes could produce fruitful results, one cannot help wondering what sort of creative sparks could be generated between interacting masters of the two seemingly different cultures?

The day before the Institute was officially opened, its inaugural program on “Coding Theory and Data Integrity” was launched and it will last until December this year. For the following two six-month periods next year, two programs of a completely different nature have already been planned, advertised and publicized: one titled “Post-genome Knowledge Discovery” (January - June 2002) and the other “Representation Theory of Lie Groups” (July - December 2002).

There is no doubt that IMS has taken off and is now in orbit.

Editor’s note: The Institute for Mathematical Sciences is located at 3 Prince George’s Park, Singapore 118402. Further information on activities and programmes of the Institute is available at <http://www.ims.nus.edu.sg>

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