EXTRACT FROM OP-SF NET

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Subject: Report on Mourad Ismail conference

The latest in the series of conferences honouring significant birthdays was that for Mourad Ismail. His 70th birthday was celebrated at an international conference *Orthogonal Polynomials, Integrable Systems and Their Applications* sponsored by Shanghai Jiao Tong University and Shaoxing University. The first two days (October 25-26, 2014) were at the Shanghai Jiao Tong University. On October 27, the participants were put on a bus for a trip of 2.5 hours to Shaoxing, a city in the province of Zhejiang to the south-west of Shanghai. That afternoon there was an excursion to the house of Lu Xun (1881--1936), a leading figure of modern Chinese literature, and to a garden of calligraphy. The next two days (October 28-29) the conference was held at the Shaoxing hotel.

The conference was focused on some areas in which Mourad Ismail has had strong influence and interest: orthogonal polynomials (his book on *Classical and Quantum Orthogonal Polynomials in One Variable* should be on the desk of anyone reading this Newsletter), integrable systems and their applications. Special functions were not mentioned in the conference title but Mourad is definitely also an expert in this field, in particular *q*-theory and combinatorics. All talks were treated in a similar way: everyone was allowed to talk for 40 minutes and 5 minutes were reserved for questions, hence no plenary talks and no parallel sessions. This has the advantage that you don't have to miss any of the talks because another interesting talk is going on in a parallel session. It has the disadvantage that you don't have any excuse to skip a talk (for some sightseeing for instance).

Let me mention some of the talks that I liked (with the risk of not being objective and with my apologies to those I am not mentioning explicitly). Alberto Grünbaum talked about quantum walks in his usual lucid style, pointing out a paper by Ismail (with H. Carteret and B. Richmond) from 2003 on *Three routes to the exact asymptotics for the one-dimensional quantum walk*} (J. Phys. A 36, (2003), 8775-8795). Nalini Joshi once more gave a wonderful talk on Painlevé equations (continuous and discrete) and their asymptotics, and Edmund Chiang talked about *Nevanlinna theory based on the Askey-Wilson operator.*

On the second day, Pierre van Moerbeke explained how domino tiling and random matrices contain a lot of beautiful mathematics involving special functions and discrete integrable systems. I was also very much pleased with the talks of Dan Dai and Yu-Qiu Zhao about Plancherel-Rotach asymptotics and orthogonal polynomials with singular weights. They both used the Riemann4 Hilbert approach that, during the past few decades, has turned out to be so useful for obtaining asymptotic results for orthogonal polynomials.

In Shaoxing I liked the talk of Jacek Szmigielski a lot, where he combined nonsmooth waves (peakons), integrability, orthogonal and bi-orthogonal

polynomials into a very tasteful exposition. I would like to mention here that Szmigielski and Beals have written a *Gentle Introduction to Meijer G-functions* in Notices Amer. Math. Soc. 60 (2013), 866-872, which I strongly recommend to all the members of our SIAG. Xiangke Chang gave some examples about the relationship between integrable systems (discrete, semi-discrete and continuous) and orthogonal polynomials, thereby touching upon the main themes of this international conference. Guillermo López Lagomasino explained various properties of Nikishin systems and in particular the convergence of Hermite-Padé approximants to rational perturbations of such systems. On the last day of the conference, Luc Vinet introduced the audience to Bannai-Ito polynomials and the related algebra with many applications in mathematical physics. These orthogonal polynomials are somewhat hidden in the Askey table since they are $q=-1$ limits of the q-Racah polynomials, but they really deserve to be studied as they are, and not as limits of q-Racah polynomials. Dennis Stanton gave a talk with one theorem about a general class of basic hypergeometric polynomials for which he gave orthogonality relations (extending the orthogonality relations for Askey-Wilson polynomials). The last talk that I want to mention explicitly is that of Vincent Genest since it involved multivariate orthogonal polynomials, with various group theoretical interpretations and some applications.

The conference was quite successful and the organizers (Xing-Biao Hu, Sen-Yue Lou, Mikhail Tyaglov, Guo-Fu Yu, Jun Yu, Ruiming Zhang and Zuo-Nong Zhu) succeeded in getting together excellent speakers who were able to present their recent work in areas of interest to Mourad Ismail. Mourad's influence and his supervision and collaboration with many researchers, not only established ones but especially many starting people and people from all over the world, was pointed out by many of the participants at the banquet. Thanks, Mourad, for being such a good person, scientist and friend. You really deserved being celebrated at an international conference among your peers.