Expert assessment for the recruitment of one Professor in Physics with focus on Magnetism at Lund University.

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I have considered the 8 candidates pre-elected for this position as Professor in Physics at Lund University, within the Division of Synchrotron Radiation Research of the Department of Physics. As stated in the announcement of this position, the ideal candidate would be a leading scientist in the field of advanced magnetic materials as studied both with neutron and x-ray techniques; and should provide strong teaching capabilities at different levels, from undergraduate to graduate to proper leadership of a strong research group. The ideal candidate would thus provide all that is needed to lead a high level group capable of developing new magnetic materials in house or in collaboration with other national and international institutions and of exploiting the MAX IV and ESS facilities in Lund.

For the 15 candidates, I have evaluated their scientific career and expertise. They are very diverse in age and publication scores. Although I found that all of them have a sufficient scientific experience and/or productivity and/or creativity in elaborating a research plan, I had no particular difficulties in ranking them as summarized below. The ranking, made in 3 tiers, is strongly influenced by their teaching records: as opposite to the scientific curriculum, the teaching experience of some candidates looks quite limited, and only a minority of the candidates can put forward a complete teaching expertise. In my opion, one candidate outstands all the others, for the excellence of his research, the broad experience and the worldwide reputation.

Tier 1 (best candidates, full compliant with the announcement):
    Hermann Dürr, Kim Lefmann

Tier 2 (good candidates, with good scientific CV but not very strong in teaching):
    Elisabeth Blackburn, Bella Lake, Danny Mannix, Jan Dreiser, Mechthild Enderle, Roland Mathieu

Tier 3 (fair candidates, with good scientific CV but weak in teaching or too inexperienced):
    Petronella Deen, Martin Valdor, Amitesh Paul, Björn Fåk, Randy Fishman, Edwin Fohtung, David Navas Otero

Below I am listing the 15 candidates from the best to the less strong, stating briefly the reasons behind my judgment.

Hermann Dürr

He is a pioneer of the study of magnetization dynamics using x-ray spectroscopy and scattering, he is worldwide recognized as an authority in this field. Very experienced researcher, he has led important groups in Germany and USA. His publication and citation record is excellent (h=34 from ISI WoS). The work he has done in the last years at the free electron laser at SLAC has been very innovative and challenging, because XFELs are new and complex instruments that require a time consuming and risky work for the optimization of the

experimental conditions , in a very competitive environment. He has experience as teacher at undergraduate level and he has supervised several PhD students over a long period of time. His expertise with synchrotron radiation techniques related to magnetism is outstanding. He has no experience with neutron techniques, which is the only weakness with respect to the requirements listed in the announcement, but hes scientific maturity can compensate this lack of specific experience.

Kim Lefmann

He is a well-established neutron scientist in Denmark, expert in inelastic neutron scattering instrumentation and in quantum magnetism, multiferroics, superconductors. He holds an academic position in Copenhagen, but has been constantly working to the development of instrumentation for neutron facilities. He has been an advocate for the ESS, and has established a consequent scientific network inside and outside Denmark. His publication record is very good, with a good citation score (h=24). He has a very extensive teaching experience both at undergraduate and PhD level. His main weakness is the lack of experience with x-ray spectroscopy or x-ray scattering techniques, but he seems open to move in that direction in the future. His scientific profile is less outstanding than the previous one but he is very competent in the development of instrumentation, so he deserves being ranked in tier 1.

Elisabeth Blackburn

She is a young a dynamic researcher in the field of non-conventional superconductivity and strongly correlated electron systems. She has experience both with neutron and x-ray scattering techniques, both relevant for the study of magnetism as requested in the job announcement. She has also a specific experience with the development of instrumentation. Her teaching experience, with exceptional engagement and dedication, is noteworthy, and balances her publication record, good but not exceptional (h=11 from ISI WoS). She has experience in collaborating with high level groups at international level. Some of her publications appeared in the last years are considered very important in the field of high Tc superconductivity. She has an academic profile, but good familiarity with large scale facilities. Despite her being relatively young, she has all the qualities for succeeding in leading a group at Lund University working on magnetism.

Bella Lake

She is a very experienced researcher in the field of strongly correlated electron systems, quantum magnetism and neutron scattering techniques. Her career has developed mainly at neutron facility (HZB, Berlin) as group leader (head of research Department) in the past 6 years she has accumulated extensive management experience. Her publication record is very good, although the citation score (h=21) is probably not as high as one could expect from her position as head of a quite large research group. Her publication highlights are focused on quantum magnetism studied by neutron scattering techniques. An important contribution by this candidate is the package "SpinW" for the calculation of spin wave dispersion in arbitrary spin structures, available on-line from the Psi web pages. Her teaching experience encompasses supervision to PhD students and a regular class at TU Berlin on a specialized subject. Her experience and scientific solidity make her an excellent candidate (stronger on the neutron than on the x-ray side), although her teaching experience is probably slightly weaker than for the previous two candidates.

Danny Mannix

He is a good scientist working since 20 years on magnetic scattering of neutrons and x-rays. His competences are on multiferroic materials and the specific experimental techniques used to study their orbital and spin orders. In his current position he has relatively limited managing responsibilities. He masters both neutron and x-ray diffraction techniques relevant for the study of magnetism, but has limited spectroscopy experience. His publication record is good, but the number of citations is not outstanding (h=18). He has quite limited teaching experience at undergraduate level, and has supervised some undergraduate students, but no PhD students (as main supervisor). He holds the same seniority as B. Lake, but has held much less responsibilities as group leader. On the other hand he has a good productivity as independent researcher. For these reasons this candidate is ranked in the second tier but below the two other candidates listed just above.

Jan Dreiser

He is an expert in x-ray spectroscopy and inelastic neutron scattering used in the study of molecular magnets. His competences are in the preparation of the samples by deposition of the relevant molecules onto convenient substrates and their characterization by advanced spectroscopy and electron microscopy. He is currently employed as beam line scientist at the SLS, where he could use x-ray absorption spectroscopy for his studies. He has quite limited teaching experience (particularly at undergraduate level), and has acted only as co-supervisor of PhD students. His publication record is good, with a high level of citations (h=21) in consideration of the relatively low number of articles (46). His intention is to pursue the study of molecular magnetism with x-rays and neutrons. His good scientific score compensate only partly the lack of teaching experience. He ranks at a similar level as the previous candidate.

Mechthild Enderle

She is an expert in quantum and frustrated magnetism as studied by neutron scattering. Presently she is a scientist at the ILL, and in the past 20 years she has been studying, by inelastic neutron scattering, a variety of materials showing complex spin arrangements and dynamics. In the position of responsible of a user instrument she has been collaborating with several groups. Her publication record is reasonably good as well as the number of citations (h=24). Over the years she has constantly been teaching in seminars and specialized courses, and has supervised a large number of students. Overall her profile is quite good, but suffers for the lack of experience with x-ray techniques.

Roland Mathieu

He is a researcher in the field of multiferroic and ferroelectric materials. His expertise is in the growth and characterization of bulk and film samples. He has been applying a variety of techniques to the characterization of magnetic samples, including neutron and x-ray diffraction and x-ray absorption spectroscopy. Presently on a junior professorship in Uppsala, he has a good network of collaborations. His publication record is very good with a consistent citation level (h=20). He has a broad experience with teaching at undergraduate level; he has supervised only a few PhD students. His profile fits relatively well with the job description, but his approach is probably less innovative in the utilization of neutron and x-rays with respect to other candidates.

Petronella Deen

She is a researcher in the field of frustrated magnetism, heavy fermions and superconductivity, studied mainly by neutron and x-ray scattering. She has always been working at synchrotron or neutron facilities. She is

presently working for the ESS. With respect to other candidates coming from neutron facility, she has also accumulated an experience of several years with synchrotron radiation. Her publication record is good, and the number of citations could have been higher (h=14) at this stage of the scientific career. Her teaching experience is quite limited, including the supervision of undergraduate and graduate students. Overall her profile does not appear very innovative and is ranked in tier 3.

Martin Valdor

He is a chemist and physicist of magnetic oxides. He is expert of materials synthesis and characterization with a variety of techniques, lab based and exploiting x-rays and neutrons. Group head at a Max Plank Institute in Dresden he has worked on a variety of materials over the years. His strong point is in the large number of techniques employed and in the diversity of systems studied over the years. His publication record is quite good, but the citations are not as high (h=15). He has a quite long teaching experience at undergraduate level, but only at seminar level, apparently nothing in official coursed. He has supervised a small number of students (undergraduate and graduate). Overall his profile is not strong enough to be ranked higher than tier 3.

Amitesh Paul

He is an expert of growth and characterization of magnetic and non-magnetic films, interfaces and nanoparticles. Presently at TU Munich as group leader in research using neutrons (in particular neutron reflectometry). He has some teaching experience at undergraduate level on one specialized course, and has supervised several PhD students over the years. His expertise is mainly on the growth of materials, which could be a strong point with respect to the position description. However his experience in advanced techniques used in magnetism (in particular x-ray spectroscopy and scattering) appears to be quite limited. His abilities in leading a research group are only partially demonstrated. His publication record is good (h=15), but not strong enough to be ranked in tier 2.

Björn Fåk

He is a very experienced neutron instrument scientist at the ILL, expert in inelastic scattering experiments for the study of quantum magnetism, spin liquids and strongly correlated electron systems. He proposes to continue his activity in the same field. He has limited teaching experience at undergraduate level, and directly supervised several PhD students, but only one as main supervisor. His publication record is good, totally adequate to his career all done inside neutron facilities, with a fair citation level (h=21). His experience with x-ray techniques and sample preparation seems marginal. This candidate is weaker than those listed above due to his partial fulfilment of job requirements.

Randy Fishman

He is a very experienced theoretician working on the magnetism of complex materials, in particular multiferroics. He has been working on the theory of inelastic neutron scattering and THz spectroscopy. Working for many years at the Oak Ridge labs he has covered several high level positions. Fellow of the APS, he has a good reputation in his field. He has quite limited teaching experience at undergraduate level, and he as supervised a small number of PhD students. He has experience with direct collaboration with experimental groups. He lacks expertise with x-ray techniques for magnetism studies. Despite his good curriculum his theoretical profile is not ideal for guiding an experimental group.

Edwin Fohtung

He is a young and enthusiastic researcher working in the field of coherent scattering for the study of the dynamics of magnetic and non-magnetic systems. He is currently employed at LBNL and New Mexico University. His publication record is quite scarce (10 papers, h=5), but he has a wide international experience and fairly good teaching abilities. His CV is promising but he still needs demonstrating his ability in bringing his brilliant ideas to concrete realization and to valuable publications. At present his main expertise is in writing computer codes to simulate coherent scattering.

David Navas Otero

He is expert in the fabrication of nanostructured ferromagnetic thin films and in their study by standard lab technique, neutron reflectometry and pump-probe laser techniques. He is currently employed by a University but with no teaching duties. His teaching record is quite limited. His scientific publication record is reasonably good, compatible with his diverse experience in the past years at good institutions in Europe, as well as the citation level (h=18). He has no expertise in synchrotron radiation techniques and limited one with neutrons. This candidate has the profile less suitable to the position opened at the Lund University.