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As is customary, the report provides a well-organized overview of activities in the Center during 2015.

The emphasis is on research activity both within the Center conducted in collaboration with external colleagues. There is little attention paid to the teaching activities of the individual researchers. This is usually the case in these annual reports. Some discussion of teaching activities might be included since such activities will affect the time available for research. This would put into clear perspective the research productivity that is exhibited by most members of the Center, and would undoubtedly aid in explaining the performance of some of the lesser productive individuals. Perhaps this is being done in some way that is not apparent from the report.

Using, the same simple but crude summary statistic as has been used in past years, namely the average number of papers published in quality journals per researcher, it can be argued that 2015 represents a notable improvement over the previous year. Over the recent past prior to 2014, an average rate of just under one paper per year is reported. 2013 was an outlier year for its low productivity. In 2014, the average of one paper per researcher was exceeded. Moreover, in 2015, the upward trend continued, now reaching a level of 1.4. For mathematical research, one paper per year is an acceptable figure. That the average for the Center is somewhat higher is due to the presence of a number of highly productive researchers housed in the Center. Overall, the picture is quite promising.

There may however be some variations in the definitions of journal publications used by the four research groups. For example, the Statistics and Risk Management group lists 28 WOS published papers, but a closer inspection reveals that some of these appear in conference proceedings.

The 22% increase in research funding is commendable, as is the prospect of further increases in the next year. The level of international cooperative research continues to be high. The new program in which visiting researchers are invited for month-long stays on the campus can be expected to further foster cooperative research and should result in increased research productivity on the part of CMA researchers.

The growth in the number of integrated members of the Center from 63 to the current figure of 74 is very impressive. Funding such additions to the research faculty of the Center indicates confidence in the future of the program. The number of submitted and accepted papers in three of the four research groups in the Center promises that continued productivity indices will be evident in the next few years. It is surprising that the SRM group lists so few submitted papers, but perhaps that was an oversight. As expected the addition of Alan Crain in the algebra group has paid dividends.

Overall, the 2015 report documents a pleasing positive trajectory in research at the Center and partly because of the available increased number of researchers this can be expected to continue in future years.

Remarks on CMA 2015 Report by Charles Johnson (advisory panel member)

- 1) This is a well-organized and transparent report, albeit with a few typos and occasional awkward phrasing. In any event, the information seems well transmitted.
- 2) Clear, continued progress in research activity is demonstrated, even allowing for rather substantial changes in membership. (it might be interesting to know how much progress resulted from new vs old members.) Judging the impact of the publications aside, this gives CMA (NL) an argument that they are rapidly progressing toward being one of the very top mathematics research centers in Portugal (already top 5?).
- 3) There is a nice mix of activities from classical mathematics to modern applied mathematics to the addressing of modern integrated problems (eg aging). I am encouraged that parts of classical mathematics seem to be doing well.
- 4) The newer Center activities (postdocs, longer term visits, short courses, meetings etc) not only appear to pay off in terms of research activity (though it is hard to measure per euro against other activities), but I suspect that they valuably contribute to a visible and inspiring research environment. Other such activities should be considered.
- 5) I am struck (as i have mentioned before) by the Darwinian member inclusion criteria for the Center. I understand the motivation, but I also wonder whether the potential value of involving other department members in research is sufficiently taken into account in a world in which the Center is the only likely source of research support/inspiration. I suspect that there are other department members who are interested in research and able to be productive. So, I wonder whether an initiative to involve a few such people (beyond the collaborator status) might have value (whether or not it is cost effective). This could be considered an initiative like those in 4). Perhaps a way to initiate something (and see if it could work) would be to chat with a selection (all?) of such folks and see what they would like to do with themselves and what might make a difference to them, if they are inclined to be more active. It could also be discussed among the leadership and advisory panel.
- 6) Regarding productivity measures, there are ambiguities. I am not sure how a book (scholarly or otherwise) counts. I see a few reported (good). A good book published by a respected house should be a big deal, and, possibly, not enough credit is given. I feel that this should be discussed. I have long been concerned about this in Portugese scholarship.

I know that it is hard to evaluate publications in any objective way. This is the reason for the indirect criteria used. One that might be considered, though it is lagged, is citations. At least now this is readily available. It also transcends journal classification (which has always troubled me). In any event this could easily be recorded for each individual and used if appropriate.

I would be happy to discuss any issues further.

Charles Johnson, February 2017



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To whom it may concern

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**Review of the Scientific Report 2015 of
CMA**

The quite informative 2015 Scientific report documents another productive year for the Centro de Matemática e Aplicações (CMA) at FCT/UNL. This has been achieved despite the adverse circumstances regarding teaching load that were mentioned in previous reports.

A significant increase of number in researchers now affiliated to CMA made a (moderate but efficient) restructuring necessary, introducing themating lines and starting several initiatives, including the establishment of an exchange program to attract international researchers for a short-term scientific mission (20-40 days) at CMA, and opening a call for Post-Doc positions (two of them were filled in 2015). These initiatives, together with a development of a Ph.D. program now seem to gain momentum, and it is expected that the international network and high visibility of the researchers affiliated to CMA will support the career and faciliate placement of the successful candidates, educated by or affiliated to CMA, in renowned research institutions both in Portugal and abroad.

International visibility of all groups has been further increased by several scientific activities, first and foremost by publications in international peer-reviewed journals and proceedings, but also by presenting research results in conferences, workshops and seminars. Worldwide recognition and excellent reputation have also been augmented by organizing national and international conferences (with an autonomous budget now), and likewise by active participation in peer-reviewing and submission evaluations for top publication outlets and international conferences.

Summarizing, the report shows a significant progress and opens good perspectives of the future of CMA, either staying on a growth path or consolidating at an already high level.

Immanuel M. Bomze

