# THE ROYAL SOCIETY

## REPORT ON THE WORK OF A. BAYAD

I have known Bayad since he was a Ph. D. student in Bordeaux, and I have followed the development of his career with interest and I am therefore familiar with quite a lot of his work.

His doctoral thesis concerned the use of singular values of elliptic functions to generate Galois bases for ring of algebraic integers. The key-tool here was the use of Lagrange resolvents formed with well-chosen elliptic functions. He then applied similar tools, but now to elliptic curves with multiplicative bad reduction, to obtain quadratic Stickelberger–type relations on certain ideal classes. No doubt stimulated by his increasing circle of contacts, in more recent time he has gone on to establish a number of impressive results in the theory of modular functions and theta functions. (See for example his papers on the Weierstrass zeta function and on Segal modular forms.) With hindsight it is striking to see how, working with in the common frame of arithmetic elliptic functions, he has produced such a pleasing breadth of results ranging over so many different aspects of algebraic number theory and analysis.

Reviewing the full body of Bayad's work, I am particularly struck both his inventive use of analysis and also his enviable facility to execute complex calculations and manipulate large formulae. He is an energetic and productive researcher who has demonstrated a keen passion for his subject, producing a steady stream of publications in international quality journals.

In summary, Bayad is a fine mathematician who excels in carrying out detailed computations in interesting areas of mathematics. He has several fine results to his name, and is a mathematician of good standing in the international community. In am therefore very pleased to recommend that he be awarded the Habilitation.

Yours sincerely,

Prof. M J Taylor FRS
Vice President of the Royal Society.