

Comments of the KMI International Advisory Board

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We are delighted to celebrate the 10th anniversary of KMI. We congratulate KMI on its selection for NAIAS. The following remarks are intended to help secure its future funding by the University of Nagoya.

KMI is well organized, and its members perform excellent research with visible international impact. The international prominence of KMI is impressive. Its worldwide stature has grown rapidly. We note that the number of invited international presentations increased from 18 to 54 over the years 2018 to 2019. Some 80% of papers published in 2019/2020 represented international collaborations.

The theme of the Dark Universe is intellectually exciting and admirably adapted to the future development of KMI. The newly formed network on dark matter combines leading international institutes with KMI. On the experimental side, we are impressed by the key roles played by KMI in world-leading experiments such as ATLAS, Belle II, CTA, XENONnT, Hyper-K and XRISM. Many forefront issues are addressed by KMI researchers, for example there is scope for a major advance in understanding discrepancies in neutron lifetimes. We also single out pilot studies for novel directions in dark matter astrophysics that strongly merit expansion into potential breakthrough experiments, including emulsion detector applications to DM directionality and gamma ray astronomy. KMI is clearly a world leader in several experimental activities, and is well positioned to formulate a compelling case to the university to reinforce its international leadership role.

Theoretical physics is well represented in the KMI portfolio, from QCD to string theory, gravitational physics and cosmology, via attempts to push beyond the SM. KMI is well placed to play a key role in the deployment of new theoretical ideas. We strongly recommend reinforcement of theoretical physics activities that complement many of the experimental themes. This could be achieved by adding postdoctoral appointments at the theory interface with experiment, and by developing more joint seminars and collaborations. KMI has had great success in placing its junior researchers into long term appointments, and now is an excellent time to make excellent fixed term hires from an outstanding candidate pool. This would reinvigorate the theory/experiment complementarity that should be an integral component of the planning for the future of KMI. It would reinforce the role of KMI in NAIAS and enhance its international visibility.

We commend KMI's educational activities, including schools and outreach activities. These play a key role in maintaining and building support not only within the university but also in the broader community. Seminars in the COVID era present a new opportunity for further enhancing the intellectual life of KMI. We recommend initiation of a pro-active seminar program that draws on world-wide participation by leaders in the field.

