MEMORANDUM

TO: Gary Ostrander, Vice Chancellor for Research (UH)
FROM: Guenther Hasinger, Director, Institute for Astronomy (IfA)
SUBJECT: Institute for Astronomy Action plan (D/D Advance of July 21)

I. Astrophysics Undergraduate Program

(This refers to points 1. Retention and Graduation Rates & 3. Quality of Graduate Education)

Astronomy (ASTR) undergraduate Introductory courses have historically been an extremely popular science elective at UH-Manoa, with ~800-900 students annually enrolling in the ASTR100-level courses. With the increasing visibility of astronomy as a career path, and with the increasing interdisciplinary nature of astronomy programs, there continues to be strong and broad interest in providing a formal curriculum path for UH-Manoa undergraduate students who wish to further their studies in astronomy. This can best be achieved through the establishment of astrophysics major as well as astronomy minor degree options, both of which are needed to satisfy the demand from a wide cross-section of undergraduate majors (both BS and BA).

The establishment of an Astrophysics undergraduate program has been already strongly recommended by the previous high level visiting committee of IfA in 2001. With the advent of the new director, IfA currently has embarked on a major faculty retreat and self-study process, which will hopefully lead to a new visiting committee in 2012. We have discussed the idea of creating a new astrophysics undergraduate program with the Dean of Natural Sciences and with the Department of Physics and Astronomy with very positive feedback. It was decided to form an interdisciplinary working group between faculty members of the IfA and the Department to shape out the ideas and the necessary resources.

The majority of the non-introductory courses needed for both the astrophysics major and astronomy minor options either already exist within the current ASTR 200-400 level course listings, or will exist through the addition of cross-listed, non-introductory courses that are (or will be) offered by other departments (e.g. geosciences, chemistry, biology, engineering). A number of additional ASTR non-introductory courses (8) will need to be offered for the four-year Astrophysics BS major and some of the physics courses can be enriched with astrophysical contents. In addition to the astrophysics major we can offer Astronomy minors in interdisciplinary fields like Astro-Biology, Astro-Chemistry, Astro-Engineering etc. (Astro-X).
The establishment of undergraduate major/minor degree options in Astrophysics and Astronomy at UH-Manoa is both timely as well as necessary in order to meet the increasing demand from undergraduate students wishing to further their careers in astronomy and/or their knowledge of astronomy as it relates to their major field of study. The three degree options described provide the breadth needed in order to accommodate both science and non-science majors.

Based on current queries from undergraduate students and current enrollment in ASTR non-introductory courses, we might reasonably expect the following numbers (per year) in each option: (~5-8) BS Astrophysics major, (~20-25) BS Astro-X minor, (~30) BA Astronomy minor. This initiative will require hiring some additional faculty members in the department of Physics and Astronomy as well as administrative support for these undergraduate initiatives (at the ~0.5 FTE level). Infrastructure for lab courses on the Manoa Campus (e.g. a small telescope, ideally a planetarium) would be highly beneficial and would raise the visibility of this program.

II. Venus Transit in a Hawaiian Perspective

(This refers to point 2. Native Hawaiian Advancement)

On June 5, 2012 the planet Venus will transit in front of the sun. This is an event that only happens about every 130 years in pairs eight years apart. The transit in 2012 is the second of a pair and will be completely visible on the Hawaiian islands from about noon to sunset. The IfA, together with other astronomical organizations (e.g. Imiloa) on the Neighbor Islands is planning major outreach events on Oahu, Maui and Big Island on this day. These events can be of significance for the Hawaiian community. At the last Venus transit visible from Hawaii in 1874, King Kalakaua invited an expedition of British astronomers to the Islands, who brought along a number of telescopes and equipment and made observations from Big Island, Oahu and Kauai. The book “Hokuloa” by Michael Chauvin (published 2004 by Bishop Museum Press) gives an excellent account of the events around the Venus transit. Later, in 1880, King Kalakaua, who was polyglot and very interested in modern technology, expressed his interest in writing to have an astronomical observatory in Hawai‘i and indeed, in 1883 the first permanent telescope in Hawaii was installed on the campus of Punahou School. While Chauvin’s book “Hokuloa” is very well researched and makes references to artifacts and records of the 1874 event here in Hawai‘i, it is written from the perspective of an astronomer and does not cover the successive events.

In order obtain information about the Hawaiian perspective on astronomy in these years and to help prepare the Venus transit in 2012 one idea is to ask one or two students of Hawaiian studies to look at the Hawaiian Newspaper records in the time 1873-1900 to find and translate articles relating to astronomy. The newspaper Ka Nūpepa Kū‘oko‘a (The Independent Newspaper) was the only Hawaiian language newspaper in print during this time and should provide a valuable resource.