Example of a Host Opportunity

Institute: University of Indonesia

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Duration of Hosting Opportunity: 6-12 months

Supervisor: Professor Farida Pranoto. I have been a Professor of Chemistry Science at the University of Indonesia for the last six years. My research interests are in source appointment of air pollution in urban areas of Indonesia and the broader Southeast Asia region. I currently run a research group of 5 people (3 graduate students and 2 postdoctoral researchers). I have published 23 papers both internationally and nationally, as well as presented at international and national conferences. I have received scientific funding from the Government of Indonesia and the World Health Organization.

Work Environment: We can provide a desk in a secure, shared office area at our university. Here, the student will have access to electrical power and internet via plug-in cable. The student will share this space with other researchers, including professors, postdocs, and students. As described in the project description below, the student will be assessing air quality samples at two sites in Jakarta. Our research team will have the student do this at locations we have used previously for the same purpose. These sites are secured areas, and we will assist the student in finding public transportation to and from this site.

Host Support for Fellow: Housing, Office Space, Language Training, Other: Space and Access on university servers to create a website

Project Description: Particulate matter (PM; e.g. dust and smoke) air pollution poses a serious health risk to citizens of Jakarta, Indonesia. Also, PM pollution in the form of black carbon from combustion sources is believed to be a significant contributor to global warming. Our research group would like to assess the current progress of local measures to reduce PM mitigation measures by conducting a field campaign to quantitatively assess the sources of PM in Jakarta, Indonesia over the period of 6-12 months.

The proposed project focuses on determining air pollution sources in Jakarta using the techniques of x-ray fluorescence spectroscopy (XRF) and positive matrix factorization (PMF). The student will be responsible for using our sampling equipment (air pump, collection chamber, quartz filters) to take PM2.5 samples 3x per week at two pre-determined sites in Jakarta over a period of 6 to 12 months. The student will also use our XRF spectrometer to

analyze collected samples during that period, and perform PMF to determine what sources from which the PM2.5 is originating. Lastly, the student will create a webpage (e.g. a wiki) that shares and stores our research results.

This GRIFN Fellow will gain experience conducting research in the field, and our team will benefit from their presence, as we are currently lacking an interested graduate student with atmospheric science expertise. We would also hope the GRIFN Fellow might bring some statistical methods expertise to our group, and be willing to help students in our group with their scientific writing and speaking in English. The GRIFN Fellow be able to access meteorological data taken at our university, and other relevant data taken by our research group. The Fellow would also have many opportunities to interact with scientists in our group, as well as at the University of Indonesia, to learn about existing related projects. It is our hope that by hosting a Fellow, we will begin a relationship with both the Fellow and their U.S. institution that may lead to future collaborations.

Our research team intends to publish results from this work in a peer-reviewed journal and present it at conferences, as well as share this information on the Internet through a new web page. We hope the GRIFN fellow would be interested in taking a lead-role in helping write and present this work in these three forms, while it is understood the work is a team effort. While we can communicate with the Fellow in English, it may be to the advantage of the Fellow to take classes in Indonesian for a good general experience in Jakarta. We are able to provide the Fellow with free classes at our university. In order to occasionally transport equipment, as well as frequently travel to and from the site using public transportation or walking in hot weather, the Fellow should be in good health.

Expected Development Outcomes:

This project will advance development by:

1) Helping our research and the Fellow to do research in an area that is important to local policy and health in Jakarta: air quality.
2) Improving our students' abilities to communicate in scientific English by interacting with the Fellow.
3) Improving the technical capacity of the university by hopefully obtaining a fellow with expertise in statistical methods and who is willing to share them with our students.
4) Creating new relationships with scientists and universities that may lead to future collaborations through the web page with our project results and a collaboration with the Fellow.