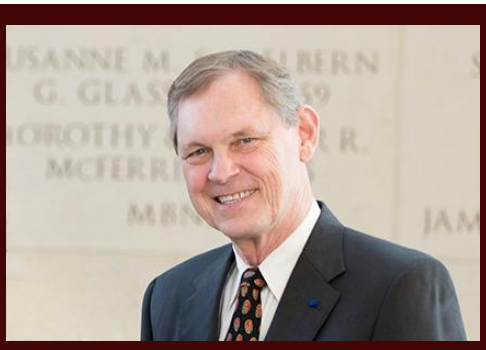
Newsletter Issue 12

From the Founding Director



As the fight against the coronavirus continues to affect us all, Hagler Institute Fellows are contributing in important ways to help combat this pandemic. Dr. Peter Hotez, who has developed a promising vaccine, has been in high demand as a commentator. Lately, Dr. Stefan Kaufmann has been interviewed in public broadcasts about his new clinical trial for a drug to help the immune system fight the coronavirus. Dr. Vincent Poor is applying network modeling to improve the analysis of the spread of the virus.

In challenging times, our nation calls all of us to pull together. We especially rely upon the innovations and hard work by the best and brightest among us. The Fellows of the Hagler Institute for Advanced Study, especially those with expertise in virology and modeling of pandemics, are among the most critical of our “best and brightest” for the current crisis. These outstanding individuals are answering the call to service of our nation and, indeed, the world. This newsletter

describes their work, as well as other exciting news for the Institute.

This time of reduced mobility and separation allows a period of introspection, and, in closing, I offer some personal hopes. When we emerge victorious in the fight against COVID-19, may we, individually and collectively, emphasize values that will stimulate tremendous scientific and economic progress. May we rediscover in ourselves a compass that locates true north and elevates those moral and ethical values that lead to a desire for truth and unity, rather than the destructive distortions and polarizations that were a precursor plague to being hit by COVID -19.

On behalf of the staff at the Hagler Institute, I wish you a safe and healthy time in both body and spirit as we navigate these uncharted waters.

Best wishes to all,
John L. Junkins

Hagler Fellows Work to Fight the COVID-19 Pandemic

PETER HOTEZ AND A COVID-19 VACCINE

Peter Hotez, 2019-2020 Fellow of the Hagler Institute for Advanced Study and Co-Director of the Center for Vaccine Development at Texas Children's Hospital, Dean, National School of Tropical Medicine, and Professor at Baylor College of Medicine in Houston, has been updating the public about the coronavirus on various news broadcasts. Dr. Hotez and his team are involved in developing protein-based vaccines for COVID-19, using a yeast-derived protein comprised of a receptor binding domain. The vaccine has already been manufactured and is ready for clinical trials. In addition, Hotez's team has summarized a set of published studies that support his protein-based vaccines as holding great promise for being effective against COVID-19. He is searching for funding for the clinical trials.

Dr. Hotez testified in late February before the House Committee on

Science, Space, and Technology and contended that government funding for vaccines should change from reactions to immediate needs to a longer run view of protection. With the necessary clinical trials, even a very effective vaccine for coronavirus, for instance, is more than a year away.

For more information about the scientific aspects of Dr. Hotez's vaccines, see his working paper with Maria Elana Bottazzi in the March 31, 2020 on-line publication, preprint, titled "**Developing a Low-Cost and Accessible COVID-19 Vaccine for Global Health**." For some review of his efforts at obtaining funding for a clinical trial, see this **link**.

H. VINCENT POOR MODELS THE SPREAD OF CORONAVIRUS

H. Vincent Poor is a 2018-2019 Fellow of the Hagler Institute for Advanced Study and was presenter of the Institute's Fall 2019 Eminent Scholar Lecture. Dr. Poor is the Michael Henry Strater University Professor of Electrical Engineering and Interim Dean of Engineering at Princeton University. Professor Poor's earlier work with the mathematical models of "networking" contributed greatly to the development of networks to enable more efficient cellphone and computer transmissions, through which so many people communicate.

Dr. Poor has published a **paper** with four co-authors (some from Carnegie Mellon) in the March 17, 2020 issue of the *Proceedings of the National Academy of Science* in which he applied his networking models to track the spread of the coronavirus. His approach can more effectively track the virus than models currently in use because it can account for mutations in COVID-19 and how these mutations alter the transmission of the virus through the population. The model is also being used to simulate the effects of various types of interventions, such as quarantines and isolating people. These simulations can help policy makers decide which strategies are more effective in reducing transmission of the virus and, also, where health care resources can best be put to use. For more information about their work, see this **link**.

STEFAN H.E. KAUFMANN OFFERS POSSIBLE DRUG FOR COVID-19

In a prior newsletter, we reported that 2018-2019 Hagler Fellow **Stefan H.E. Kaufmann** from the

Max Planck Institute for Infection Biology has developed a vaccine, called BTM1002, for Tuberculosis (TB). This vaccine could eradicate TB and is in the final stages of clinical trials, proving safe for use. The plan is to soon make it available for utilization in India, which is struggling with a TB outbreak.

Dr. Kaufmann has a novel idea about his TB vaccine that is receiving serious attention. He says that since TB is a respiratory disease that his TB vaccine can help strengthen the immune system against the respiratory ravages of the coronavirus. He advocates the use of his vaccine as interim assistance until something can be developed to eradicate the disease or protect us against it. Clinical trials assessing the efficacy of Kaufmann's TB vaccine against coronavirus are soon to be underway. They could take a few months, but shortly thereafter mass production could begin. See his discussion at this **link**.

VERNON L. SMITH ON THE POST-CRISIS ECONOMY

Vernon Smith, 2012-2013 Hagler Fellow, Professor at Chapman University and the 2002 Nobel Laureate in Economics, published an article in the April 6, 2020 *Wall Street Journal* titled " The Economy Will Survive The Coronavirus." He observes that all is not economic doom at present, as some businesses are thriving during the social distancing, such as mail order, delivery and take out services. Companies already under severe competitive pressure, however, will decline more quickly in this environment, and businesses offering final goods and services to consumers are feeling pain of the downturn. Small businesses will disappear and other small businesses reappear during recovery.

Once the pandemic is over, Dr. Smith predicts the economy will rebound quickly, especially with the boosts given by current government policies. The potential overreactions in government spending (only time will tell), however, may result in more dollars chasing goods than the post-crisis economy can deliver, meaning that an increase in inflation rates may be our post-pandemic challenge. The humble and wise man that he is leads him to conclude that the world is a complex place, and he has been wrong before, but

his argument is always worth considering.

Faculty Fellow Features

FACULTY FELLOW MICHAEL J. DUFF

Michael J. Duff, a 2018-2019 Hagler Fellow, has a forthcoming article in a special issue of *Journal of Physics, A Passion for Theoretical Physics: In Memory of Peter G O Freund* titled "Weyl, Pontryagin, Euler, Eguchi and Freund." Duff, Emeritus Professor of Theoretical Physics and Senior Research Investigator at Imperial College, London, is a pioneer theorist in the field of quantum gravity. His work strives to establish a theory of the basic forces behind everything happening around us that is applicable to both the atomic level and to big objects. In a simple sense, quantum gravity refers to the nexus between quantum physics (at the atomic level) and gravity (a force of large objects). In the article, Duff recounts how important scholars named in the article have impacted his research.

Hagler's Heroes: Walter and Charlotte Buchanan

The acknowledged importance of the Hagler Institute to enhancing excellence at Texas A&M is exemplified by several A&M faculty, not graduates of Texas A&M University, who have made substantial planned estate gifts to the institute. **Walter Buchanan**, Professor of Electronic Systems Engineering Technology at Texas A&M University, and his wife Charlotte have donated their estate to establish the Walter and Charlotte Buchanan Hagler Institute Chair for the College of Engineering. Hagler Institute College Chairs are among the most prestigious on campus. Such chairs can only be filled by Faculty Fellows while serving terms in the Hagler Institute. Hagler Institute College Chairs ensure that the donors' chosen college will

perpetually bring the world's finest scholars in that field to Texas A&M University, usually nominating a new candidate each year. Donors for such chairs are associated with a steady series of the world's greatest scholars in the chosen field.

Walter is a graduate of Indiana University (B.A. Mathematics and J.D.) and Purdue University (B.S., M.S. and PhD), and he has enjoyed a diverse career in industry and academia. Following several previous academic appointments, including Director, School of Engineering Technology at Northeastern University, Walter joined Texas A&M as Head of Engineering Technology and has served on the faculty since 2005. Walter and Charlotte and their substantial legacy of support of the Hagler Institute were highlighted in an October 7, 2019 Lead by Example **campaign article**. For their generosity and support of the institute, Walter and Charlotte Buchanan are our Hagler's Heroes.

**Photo credit Josh Huskin.*

Hagler Institute External Advisory Board Member Honored

SHEILA WIDNALL HONORED WITH THE 2020 GUGGENHEIM MEDAL

Sheila Widnall is an Institute Professor of Aeronautics and Astronautics at the Massachusetts Institute of Technology; an Institute Professor rank is the ultimate academic appointment at MIT. Widnall is also a recent addition to the **Hagler Institute's External Advisory Board**, and we have received news that she has been awarded the prestigious **Daniel Guggenheim Medal** for 2020. The Guggenheim Medal is one of the greatest awards for a lifetime of work in aeronautics. National and international candidates are considered from all fields and types of work in aeronautics, and the medal is awarded jointly by the American Society of Mechanical Engineers, the Society of Automotive Engineers, the American Helicopter Society, and the American Institute of Aeronautics and Astronautics. The honor will have a familiar historical beginning, with the first being awarded in 1929 to Orville Wright. Due to the current COVID-19 disruptions, Professor Widnall will now receive the medal at a July 17, 2020

ceremony in Washington, DC.

Considering her credentials, she is well-deserving of this new honor. A member of the National Academy of Engineering, Widnall was appointed the 18th Secretary of the Air Force, and she is a former President of the American Institute of Aeronautics and Astronautics. She was a member of the board that investigated the space shuttle Columbia disaster. A prolific and important researcher, she has contributed greatly to the area of fluid mechanics and the understanding of the aerodynamics of high-speed vehicles, helicopters, aircraft wakes, and turbulence.

Hagler Institute Staff Updates

JASON PENRY

The newest addition to the Hagler Institute's team is Jason Penry. Jason is Assistant Vice President for Strategic Initiatives with the Texas A&M Foundation, but is currently assigned to the Hagler Institute as our development officer. He will help by working with donors to establish endowments or estate plans for the Hagler Institute. He also works with college development officers to attract endowments for Hagler Institute College Chairs. Jason's office is located in our suite, and staff of the Hagler Institute collaborate closely with him.

Previously, Jason served as Vice Chancellor of Advancement at Arkansas State University for six years, after one year as chief of staff for the university. At Arkansas State, he spearheaded a collaborative effort to start the first medical school to open in the state in over 100 years. Before joining Arkansas State, Penry held development positions with Texas A&M University, Oklahoma State University, and within the Texas Tech University System. With each role, he was part of successful billion dollar capital campaigns. Penry holds his Ph.D. in higher education administration from Texas A&M University. He currently serves as chair of the board for the College Baseball Foundation, which governs the national college baseball Hall of Fame.

PROFESSOR JUNKINS IS ONCE AGAIN HONORED

Having last year won the **Goddard Astronautics Award**, the highest honor bestowed on an engineer specializing in Astronautics, University Distinguished Professor John Junkins and Director of the Hagler Institute, has been honored to receive another significant award for his research. He is the 2020 recipient of the ***Research Impact Award*** given by the Texas A&M Engineering Extension Service. To quote Professor Rodney Bowersox, head of the department of aerospace engineering:

The Impact awards highlight research that has had an impact, broadly defined as leading to outcomes that extend beyond conventional boundaries. Dr. Junkins is being recognized for "solving a 52-year-old, long-standing problem in orbit transfer optimization."

The Institute staff extends its hearty congratulations to our leader for the continuing excellence of his scholarship.

If you have news to share, please send articles, suggestions, or other information to:
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HAGLER INSTITUTE FOR ADVANCED STUDY
at Texas A&M University