



PAVING THE WAY FOR FUTURE SPACE TELESCOPES WITH THEORY AND SIMULATIONS

AARON YUNG

GODDARD SPACE FLIGHT CENTER

NASA'S MOST POWERFUL FLAGSHIP OBSERVATORY JWST WAS LAUNCHED OVER A YEAR AGO AND HAS BEGUN TO UNCOVER THE PHYSICAL ORIGIN OF OUR UNIVERSE. WITHIN THE FIRST FEW MONTHS OF ITS SCIENTIFIC OPERATION, OBSERVING TEAMS ARE ALREADY REPORTING GALAXIES DETECTED AT UNPRECEDENTED DISTANCES, EQUIVALENT TO LOOKING BACK AT A YOUNG UNIVERSE THAT IS ONLY A FEW PERCENT OF ITS CURRENT AGE. IN PREPARATION OF THE SEARCH FOR DISTANT GALAXIES, THE DEVELOPMENT AND OPTIMIZATION OF OBSERVING STRATEGIES RELY ON INPUTS FROM PHYSICAL MODELS AND SIMULATIONS. THROUGH THE WORK SERIES SEMI-ANALYTIC FORECASTS FOR JWST, I DELIVERED A WIDE VARIETY OF PREDICTED GALAXY PROPERTIES AND DATA PRODUCTS TO SUPPORT JWST PROGRAMS. AND SOON JWST OBSERVATIONS WILL BE USED TO CONFRONT THESE PHYSICAL MODELS AND HELP REFINE OUR UNDERSTANDING OF GALAXY FORMATION IN THE EARLIEST EPISODE OF COSMIC HISTORY. I WILL GIVE AN OVERVIEW FOR THE LATEST OBSERVATIONS AND SHOWCASE SOME OF THE LATEST SIMULATIONS. I WILL ALSO COVER UPCOMING FLAGSHIP OBSERVATORIES AND HOW WE ARE GETTING READY FOR THEM, INCLUDING PREDICTIONS FOR FUTURE DEEP-WIDE SURVEYS WITH NASA'S ROMAN SPACE TELESCOPE, AS WELL AS ESA'S EUCLID AND THE CANADIAN MISSION CONCEPT CASTOR.