FOR THOUSANDS OF YEARS,
MANKIND HAS WONDERED
"ARE THERE PLANETS AROUND
OTHER STARS?"
BUT WE DIDN'T KNOW.
WE DIDN'T KNOW IF THERE WERE
ANY PLANETS AROUND OTHER STARS.
>> ZERO AND LIFTOFF
OF THE DELTA TWO ROCKET
WITH KEPLER, ON A SEARCH
FOR PLANETS IN SOME WAY
LIKE OUR OWN.
>> BEFORE THE LAUNCH OF KEPLER,
MOST OF THE PLANETS WE KNEW ABOUT WERE REALLY BIG PLANETS, LIKE JUPITER.

BUT KEPLER WAS SO SENSITIVE, THAT WE STARTED FINDING SMALLER AND SMALLER PLANETS.

WE DISCOVERED PLANETS SMALLER THAN HAD EVER BEEN DISCOVERED BEFORE AND JUST, MANY OF THEM.

INDICATING THAT THE GALAXY IS FULL OF PLANETS.

CRAZY WORLDS THAT WE DIDN'T PREDICT, THINGS
THAT WE HADN’T IMAGINED.

WE FIND PLANETS ORBITING SO CLOSE TO THEIR PARENT STAR THAT THE STAR-FACING SIDE HAS TEMPERATURES IN EXCESS OF THAT REQUIRED TO MELT IRON.

THESE PLANETS HAVE AN ENTIRE HEMISPHERE THAT’S LIKE A LIQUID OCEAN.

BUT IT’S NOT AN OCEAN OF WATER.

IT’S AN OCEAN OF MOLTEN ROCK.

WE SEE PLANETS THAT ARE ORBITING NOT ONE BUT TWO STARS.

THAT IS, IF YOU LOOK IN

THE EAST YOU WOULD SEE

44
00:01:13,739 --> 00:01:15,974
NOT ONE STAR RISE BUT TWO.

45
00:01:20,612 --> 00:01:21,881
>> ALMOST ALL THE ASTRONOMERS

46
00:01:21,881 --> 00:01:23,582
THAT I KNOW GREW UP

47
00:01:23,582 --> 00:01:25,218
READING SCIENCE FICTION.

48
00:01:25,218 --> 00:01:26,286
THAT'S WHY A LOT OF THEM

49
00:01:26,286 --> 00:01:27,519
GOT INTO THE BUSINESS OF

50
00:01:27,519 --> 00:01:28,787
LOOKING FOR PLANETS

51
00:01:28,787 --> 00:01:30,256
IN THE FIRST PLACE.

52
00:01:30,256 --> 00:01:31,658
TO FIND OUT IF ANY OF

53
00:01:31,658 --> 00:01:33,225
THIS, YOU KNOW, FANTASTIC

54
00:01:33,225 --> 00:01:35,594
SPECULATION THAT INSPIRED US,

55
00:01:35,594 --> 00:01:37,329
COULD BE TRUE.

56
00:01:37,329 --> 00:01:39,031
AND NOW WE FIND OUT THAT,

57
00:01:39,031 --> 00:01:40,866
YEAH, IT COULD BE TRUE.
WE LEARNED FROM KEPLER THAT THE MOST COMMON TYPES OF PLANETS IN THE GALAXY ARE UNLIKE THE PLANETS IN OUR OWN SOLAR SYSTEM. THESE WORLDS ARE INTERMEDIATE IN SIZE BETWEEN THE EARTH AND NEPTUNE, BUT WE'RE NOT EXACTLY SURE WHAT THEY'RE MADE OF.

WHAT ARE THE THINGS THAT WE KNOW NOW, THAT WE DIDN'T KNOW THEN? I MEAN, THINGS LIKE PLANETS.
ARE UBIQUITOUS.

PLANETS ARE DIVERSE.

THE STARS THAT WE FIND

PLANETS AROUND ARE DIVERSE.

THE SYSTEMS THAT PLANETS LIVE IN VARY WIDELY.

>> IT WAS BREATH-TAKING TO SEE ALL THE PLANETS COME ROLLING IN FROM THIS EXQUISITE DATA OVER THE YEARS THAT WE WERE COLLECTING DATA WITH KEPLER.

IN THE END, WE FOUND DOZENS OF SMALL, POTENTIALLY
ROCKY WORLDS ORBITING IN THE "GOLDILOCKS ZONE" OF THEIR STARS.

THAT DISTANCE AT WHICH YOU COULD HAVE LIQUID WATER POOLING ON THE SURFACE OF THE PLANET, CAPABLE OF SUPPORTING LIFE AS WE KNOW IT.

>> THE SCIENCE VALUE OF THE COLLECTED DATA SPANS ALMOST EVERY FIELD OF ASTRONOMY AND PLANETARY SCIENCE.

IT REVOLUTIONIZED NOT JUST EXOPLANETS, NOT JUST STARS,
BUT A LARGE NUMBER OF

THE SCIENTIFIC FIELDS

OF ASTRONOMY TODAY.

>> THERE WAS ONE SUMMER WHERE

I WORKED AT AN OBSERVATORY

AND I WOULD GO OUTSIDE AT NIGHT

AND LOOK UP AT THE STARS

AND JUST BE BLOWN AWAY

AT HOW VAST SPACE WAS.

AND I ACTUALLY FELT

A LITTLE LONELY.

AND WHEN I GO OUT AND I LOOK

AT THE NIGHT SKY NOW,

RATHER THAN BEING AWESTRUCK

BY THE VASTNESS, I'M AWESTRUCK
BY THE POSSIBILITY.

>> THERE AREN'T THAT MANY OPPORTUNITIES IN LIFE WHERE YOU GET TO PARTICIPATE IN A PROJECT AS IMPORTANT AS KEPLER IS THAT ANSWERS SUCH A FUNDAMENTAL QUESTION THAT WE'VE BEEN ASKING Ourselves FOR SO LONG.

NOW WE KNOW WHEN WE LOOK UP INTO THE NIGHT SKY THAT EVERY STAR WE SEE HAS, ON AVERAGE, AT LEAST ONE PLANET.

AND THAT MANY OF THOSE PLANETS
ARE SIMILAR IN SIZE TO THE EARTH
AND A CHANCE FOR LIFE
AS WE KNOW IT ELSEWHERE.
>> SEARCHING FOR LIFE ELSEWHERE
IS ONE OF THE KEY THEMES
THAT DRIVE OUR SCIENCE PORTFOLIO
AND AT THE CENTER OF THAT
IS KEPLER.
NEW MISSIONS LIKE
THE TRANSITING EXOPLANET
SURVEY SATELLITE, TESS,
AND THE JAMES WEBB SPACE
TELESCOPE WILL BUILD ON
KEPLER'S SUCCESS AND TAKE
OUR SEARCH FOR LIFE

TO NEW HEIGHTS.

>> IT HAS BEEN EXTREMELY

GRATIFYING TO SEE THE DATA

COME BACK FROM THE MISSION

AND SHOW WHAT WE WANTED TO KNOW,

GIVE US THE ANSWER.

MANY STARS HAVE PLANETS,

A LOT OF THESE PLANETS

ARE EARTH-SIZED.

THAT'S KEPLER'S LEGACY.

THIS NEW KNOWLEDGE

THAT WE HAVE ABOUT PLANETS

AROUND OTHER STARS.