# The Farthest: Voyager in Space

## Written & Directed by Emer Reynolds

# Produced by John Murray & Clare Stronge

# Director of Photography Kate Mc Cullough

# Editor Tony Cranstoun A.C.E.

## **Executive Producers**

John Rubin, Keith Potter Sean B Carroll, Dennis Liu

#### Narrator

John Benjamin Hickey

## **Line Producer**

Zlata Filipovic

## Composer

Ray Harman

## Researcher

Clare Stronge

## **Archive Researcher / Assistant Editor**

Aoife Carey

## **Production Designer**

Joe Fallover

## **Sound Recordist**

Kieran Horgan

# **Sound Designer**

Steve Fanagan

## **CGI Visual Effects**

Ian Benjamin Kenny

## **Visual Effects**

Enda O'Connor

## **Production Manager – Crossing the Line**

Siobhán Ward

## **Post Production Manager**

Séamus Connolly

## **Camera Assistants**

Joseph Ingersoll James Marnell Meg O'Kelly

## **Focus Puller**

Paul Shanahan

#### **Gaffers**

Addo Gallagher Mark Lawless Robin Olsson

## Grip

John Foster

## **Ronin Operator**

Dan Coplan S.O.C.

## Propman

Ciarán Fogarty

# **Props Buyer**

Deborah Davis

## **Art Department Trainee**

Sam Fallover

## **Art Department Transport**

Brian Thompson

## **Imaging Support**

Eolan Power

## **Production Assistants**

Brian O' Leary Conor O' Donovan

#### **Location Research**

Andrea Lewis Hannah Masterson

## **Production Accounts**

Siobhán Murray

## **Additional Assistant Editing**

Martin Fanning Tom Pierce Robert O'Connor

#### Colorist

Gary Curran

#### **Online Editor**

**Eugene McCrystal** 

Executive Producer BBC Kate Townsend

Commissioning Editor ZDF/arte Sabine Bubeck-Paaz

## FOR HHMI TANGLED BANK STUDIOS

## **Managing Director**

Anne Tarrant

## **Director of Operations**

Lori Beane

#### **Director of Production**

**Heather Forbes** 

## **Director of Communications**

Anna Irwin

## **Art Director**

Fabian de Kok-Mercado

## **Consulting Producers**

David Elisco Jared Lipworth

#### **Senior Researcher**

Laura Helft

## **Production Manager**

Lorri Garcia-Cottrell

## **Post Production Supervisor**

Arjun Rao

## **Scientific Graphics Advisor**

Mark Nielsen Satoshi Amagai

## **Executive Coordinator**

Wilma Davis

# **Executive in charge for PBS**

Bill Gardner

## **Scientific Advisors**

Reta Beebe Arthur Lonne Lane

#### **SPECIAL THANKS TO**

ANDREA ANGRUM LISA FOWLER DAVID MOORE JAMES F BLINN PADDY GIBBONS **NICK MUELLER** ALFIE BROWN **ALAN GILSENAN NORMAN NESS ALISON BUTTERS** MITCH GORDON ORLA NÍ CHONCHUBHAIR PATRICK BYRNES STEPH GREEN **RONAN O'REILLY** FIONA CAREY JEFFERSON C HALL OSTRICH FARM STUDIO JASON CLARK RACHEL HARGREAVES-HEALD FERNANDO PERALTA **ERIK CONWAY REMIGIUS HOHL** MARK PETROVICH JULIE COOPER JOHN F KENNEDY SPACE CENTER **DERMOT POWER** ASHLING COUGHLAN CHRIS P JONES CHRISTOPHER RILEY JACK COWHIG **ADANS Y KO** JOSEPH ROCHE **GLENN CUNANAN** STEFAN KUBICKI SHERRI ROWE-LOPEZ LESLIE CUNKELMAN **EMILY LAKDAWALLA** SAREGAMA INDIA LTD KAREN DETHOMAS **ELIZABETH LANDAU** MARK SHOWALTER SARAH DILLON SUE LINICK **JASON SMITH** MONIKA DOVNAR LITTON LANE AUDIO TOM SPILKER LUKE DRURY JOHN LOGSDON HILARY O'DONNELL-SULLIVAN FRANK DUFFY HENRIK LŐRINCZ **CORMAC TIERNEY** SAM DWYER ROGER C LUDWIG **NIALL TRESTON** PRESTON DYCHES DANIEL MADRIGAL BERT ULRICH LARRY ESPOSITO MARTIN MAHON **JOE WALTERS** CHUCK ESTRADA MARIE MASSEY WATERWAYS IRELAND MAGGIE FAGAN CAMILLE MATHIEU WILLIAM WEBBER **EVAN FANNING** SUN KANG MATSUMOTO THOMAS D WEEKS **GERRY FARRELL** ROBBIE MCDONALD ALBERT WHITTLESEY MAEVE FARRELL **ENRIQUE MEDINA GARY ZANK** MALIK FILIPOVIĆ ELENA MEJIA DAVE FINLEY MICHAEL MINOVITCH MICHAEL FLEMING

> PETER MORAN & THE UCD SCHOOL OF MUSIC NATIONAL RADIO ASTRONOMY OBSERVATORY SCHOOL OF PHYSICS, TRINITY COLLEGE DUBLIN

AND TO ANN DRUYAN, CREATIVE DIRECTOR, NASA'S VOYAGER INTERSTELLAR MESSAGE

AND ALL WHO HELPED US IN THE MAKING OF THIS FILM

#### ARCHIVE

AP ARCHIVE, BBC MOTION GALLERY / GETTY IMAGES, THE CONUS ARCHIVE, CORNELL UNIVERSITY, CNN, CRITICALPAST, EFOOTAGE LLC, F.I.L.M. ARCHIVES, FOOTAGE VAULT, GEOFF HAINES-STILES PRODUCTIONS INC, LOS ANGELES HERALD EXAMINER, HEARST NEWSPAPERS, LOS ANGELES TIMES, NATIONAL GEOGRAPHIC CREATIVE, NASA / JPL-CALTECH, NASA / PLANETARY DATA SYSTEM, NASA / JOHN F KENNEDY SPACE CENTER, NBCUNIVERSAL ARCHIVES, ORIGINAL SPACE AUDIO RECORDINGS COURTESY OF NASA AND DONALD GURNETT OF THE UNIVERSITY OF IOWA, PASADENA STAR-NEWS, SETI INSTITUTE, PDS RING-MOON SYSTEMS NODE (OPUS), STREAMLINE FILMS INC, UNIVERSAL TELEVISION, WPA FILM LIBRARY, MICHAEL BENSON, RICHARD BULLOCK, AMAHL DRAKE, FRANK DRAKE, DAVID DUCHNOWSKI, TIMOTHY FERRIS, BJÖRN JÓNSSON, SUE LINICK, JON LOMBERG, DANIEL MACHÁČEK, TONY MALONE, MARK PAYNE-GILL, CHARLES M REYNOLDS, PETER SEKULA, HOWARD SIMKOVER, JANET STERNBERG, MAUREEN SULLIVAN WILLIAM VINCENT, LINDA WOLF

#### **GOLDEN RECORD IMAGES**

THE ANSEL ADAMS TRUST, ARECIBO OBSERVATORY/A FACILITY OF NSF, DEAN CONGER/NATIONAL GEOGRAPHIC CREATIVE. STEPHEN DALTON DECCA RECORDS, UNIVERSAL MUSIC, FRANK DRAKE DAVID DOUBILET/NATIONAL GEOGRAPHIC CREATIVE, N R FARBMAN/TIME INC, GORDON GAHAN/NATIONAL GEOGRAPHIC CREATIVE, DONNA K GROSVENOR, DAVID ALAN HARVEY/MAGNUM PHOTOS. DAVID ALAN HARVEY/NATIONAL GEOGRAPHIC CREATIVE, J. ARTHUR HERRICK, JAMES KENDRICK, H EDWARD KIM/NATIONAL GEOGRAPHIC CREATIVE, HERMANN LANDSHOFF/MÜNCHNER STADTMUSEUM, HUGO VAN LAWICK/NATIONAL GEOGRAPHIC CREATIVE, NINA LEEN/TIME INC, JON LOMBERG, MICHAEL E LONG, WAYNE MILLER/MAGNUM PHOTOS, GEORGE F MOBLEY/NATIONAL GEOGRAPHIC CREATIVE, YUTAKA NAGATA/UN PHOTO. THOMAS NEBBIA/NATIONAL GEOGRAPHIC CREATIVE, LENNART NILSSON/TT. EDITORIAL OLIVO SA, JAY PASACHOFF, FRANCOISE RÉBUFFAT, ROW, PETERSON AND COMPANY/MILPRINT INC. TED SPIEGEL/NATIONAL GEOGRAPHIC CREATIVE. TOPFOTO UNITED NATIONS DEPT. OF PUBLIC INFORMATION, DAVE WICKSTROM

#### MUSIC TRACKS

"ALIMA SONG"
FROM THE ALBUM MUSIC OF THE ITURI
FOREST
COURTESY OF SMITHSONIAN FOLKWAYS
RECORDINGS

J.S. BACH: "BRANDENBURG CONCERTO NO. 2 IN F MAJOR, BWV 1047" PERFORMED BY ORCHESTRA MÜNCHENER BACH-ORCHESTER CONDUCTOR: KARL RICHTER (P) 1968 DEUTSCHE GRAMMOPHON GMBH, HAMBURG

"MELANCHOLY BLUES"
PERFORMED BY LOUIS ARMSTRONG AND HIS
HOT SEVEN
WRITTEN & COMPOSED BY MARTY BLOOM
AND WALTER MELROSE
COURTESY OF SONY MUSIC ENTERTAINMENT
INC
PUBLISHED BY EMI MUSIC PUBLISHING © 1927

"LIUSHUI" BY GUAN PINGHU FROM THE ALBUM *CHINA* COURTESY OF SMITHSONIAN FOLKWAYS RECORDINGS.

"WISHING ON A STAR"
PERFORMED BY ROSE ROYCE
WORDS AND MUSIC BY BILLIE RAE CALVIN
LICENSED COURTESY OF WARNER MUSIC UK
LTD

© 1977 WARNER-TAMERLANE PUBLISHING CORP.

(BMI) AND MAY 12<sup>TH</sup> MUSIC (BMI) ALL RIGHTS ADMINISTERED BY WARNER-TAMERLANE PUBLISHING CORP.

BEETHOVEN: SYMPHONY NO. 5 IN C MINOR,
OP. 67: I. ALLEGRO CON BRIO
PERFORMED BY OTTO KLEMPERER,
THE PHILHARMONIA ORCHESTRA
LICENSED COURTESY OF WARNER MUSIC UK
LTD

"TCHENHOUKOUMEN"
FROM THE ALBUM MUSIQUES DAHOMÉENNES
OCR17
COURTESY OF OCORA RADIO FRANCE

"IZLEL JE DELYO HAGDUTIN" PERFORMED BY VALYA BALKANSKA KVZ MUSIC LTD. / BALKANTON / VALYA BALKANSKA "RECORDER 4' CONSORT - THE FAIRIE ROUND"
PERFORMED BY DAVID MUNROW,
THE EARLY MUSIC CONSORT OF LONDON
LICENSED COURTESY OF WARNER MUSIC UK
LTD
BY KIND PERMISSION OF GILLIAN MUNROW

"AZERBAIJAN S.S.R. - UGAM"
FROM THE ALBUM FOLK MUSIC OF THE
U.S.S.R.
COURTESY OF SMITHSONIAN FOLKWAYS
RECORDINGS

MOZART: "DIE ZAUBERFLÖTE – DER HÖLLE RACHE (QUEEN OF THE NIGHT'S ARIA)" EDDA MOSER (SOPRANO) BAYERISCHES STAATSORCHESTER CONDUCTED BY WOLFGANG SAWALLISCH LICENSED COURTESY OF WARNER MUSIC UK LTD

"TSURU NO SUGOMORI"
PERFORMED BY VARIOUS ARTISTS/EXPLORER
SERIES
LICENSED COURTESY OF WARNER MUSIC UK
LTD

"KETAWANG: PUSPAWARNA"
PERFORMED BY VARIOUS ARTISTS/EXPLORER
SERIES. LICENSED COURTESY OF WARNER
MUSIC UK LTD

"JAAT KAHAN HO"
UNDER LICENSE FROM SAREGAMA INDIA
LIMITED
SINGER: SURSHRI KESARBAI KERKAR

"KARCZMARZE POGRANICZE" PERFORMED BY KARCZMARZE BAND

"BREAKAWAY"
WRITTEN AND PERFORMED BY GALLAGHER &
LYLE
(P) 1976 A&M RECORDS LTD.
PUBLISHED BY IMAGEM MUSIC

"CALLING OCCUPANTS OF INTERPLANETARY CRAFT"
PERFORMED BY THE CARPENTERS
WORDS & MUSIC BY JOHN WOLOSCHUK & TERRY DRAPER
(P) 1977 A&M RECORDS
©1976 MAGENTALANE MUSIC LIMITED / SOUTHERN MUSIC PUB. CO. CANADA LTD.

"US AND THEM"
PERFORMED BY PINK FLOYD
WRITTEN BY ROGER WATERS AND RICHARD
WRIGHT
LICENSED COURTESY OF WARNER MUSIC UK
LTD
PUBLISHED BY PINK FLOYD MUSIC
PUBLISHERS LTD.,
ADMINISTERED BY IMAGEM UK LTD. /
ROGER WATERS MUSIC OVERSEAS LTD.,
ADMINISTERED BY
BMG RIGHTS MANAGEMENT UK LTD., A BMG

COMPANY. © 1973 / HAMPSHIRE HOUSE PUBLISHING CORP.

(ASCAP) C/O TRO ESSEX MUSIC GROUP

J. S. BACH "3. GAVOTTE EN RONDEAU [PARTITA FOR VIOLIN SOLO NO. 3 IN E, BWV 1006]" MUSIC BY JOHANN SEBASTIAN BACH VIOLIN: ARTHUR GRUMIAUX (P) 1964 UNIVERSAL INTERNATIONAL MUSIC B.V.

"JOHNNY B. GOODE"
WRITTEN, COMPOSED AND PERFORMED BY
CHUCK BERRY
(P) 1967 UMG RECORDINGS, INC.
PUBLISHED BY JEWEL MUSIC LTD.

"ECLIPSE"
PERFORMED BY PINK FLOYD
WRITTEN BY ROGER WATERS
PUBLISHED BY PINK FLOYD MUSIC PUBLISHERS LTD.,
© 1973 / HAMPSHIRE HOUSE PUBLISHING CORP.
(ASCAP) C/O TRO ESSEX MUSIC GROUP

"JOHNNY B. GOODE"

WRITTEN BY CHUCK BERRY

PUBLISHED BY ISALEE MUSIC COMPANY (BMI)

PERFORMED AND ARRANGED BY WILL VAN

BOLDRIK

DEVELOPED WITH THE ASSISTANCE OF BORD SCANNÁN NA hÉIREANN / THE IRISH FILM BOARD

DEVELOPED WITH THE SUPPORT OF THE CREATIVE EUROPE PROGRAMME - MEDIA OF THE EUROPEAN UNION

PRODUCED WITH THE SUPPORT OF INVESTMENT INCENTIVES FOR THE IRISH FILM INDUSTRY PROVIDED BY THE GOVERNMENT OF IRELAND

IN ASSOCIATION WITH

BORD SCANNÁN NA hÉIREANN / IRISH FILM BOARD

IN CO-PRODUCTION WITH ZDF IN COOPERATION WITH ARTE, BBC AND RTÉ

A Crossing the Line and HHMI Tangled Bank Studios Production for PBS

© CROSSING THE LINE PRODUCTIONS 2017