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**RESEARCH FIELD PROJECTS, 1981-2003,**  
**UTILIZING NOAA/ETL PRECIPITATION AND CLOUD RADARS or RADAR PROCESSORS**  
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Radars:

K = NOAA/K, scanning Ka-band cloud radar

X= NOAA/C and/or NOAA/D, X-band scanning precipitation radars

M = MMCR package, vertical cloud profiling Ka-band radar with radiometers (now called NPCO)

G = GRIDS, tilt-pointing ultra-sensitive cloud radar with microwave radiometers

S= S-PROF, vertical S-band precipitation profiling radars

C= Ron Brown Research Ship, scanning C-band precipitation radar

D= RADS data system attached to other agency radars

| <b>Project Name</b> | <b>Year</b> | <b>Location</b>          | <b>Radar</b> | <b>Funding Agencies</b> | <b>Research Topic</b>                        |
|---------------------|-------------|--------------------------|--------------|-------------------------|--|
| PACJET              | 2003        | N. California coast      | X,2S         | NOAA                    | coastal and orographic rain                  |
| AIRS-II             | 2003        | Montreal, Canada         | G,K          | NOAA, FAA               | aircraft icing                               |
| TM                  | 2003        | Bahamas Islands          | X            | DOD                     | ocean surface                                |
| Crystal FACE        | 2002        | Miami, FL                | M            | NASA                    | cirrus clouds                                |
| IMPROVE             | 2002        | Mackenzie Bridge, OR     | S            | NSF                     | orographic rain                              |
| Wallop AMSR         | 2001        | Wallop Island, VA        | X            | NASA                    | rainfall                                     |
| LLCC/ABFM           | 2001        | Kennedy Space Ctr., FL   | K            | NASA                    | rocket launch cloud electrification criteria |
| TH                  | 2001        | Bahamas Islands          | X            | DOD                     | ocean surface                                |
| AOE                 | 2001        | Arctic Ocean             | S            | Univ. Stockholm         | Arctic boundary layer clouds                 |
| PACJET              | 2001-2      | three sites northern, CA | 2S           | NOAA                    | coastal and orographic rain                  |
| PACS/EPIC           | 2000-2      | Pacific Ocean            | M,C          | NOAA/NSF                | stratocumulus clouds, drizzle                |
| ARM                 | 2000        | Lamont, OK               | K            | DOE                     | stratus and cirrus clouds                    |
| HAWC                | 2000        | Hanscom AFB, MA          | K, M         | USAF                    | cloud effects on satellite commlink          |
| TAO/PACS            | 1999-00     | Pacific Ocean            | S            | NOAA                    | oceanic precipitation                        |
| RainStat            | 1999        | Erie, CO                 | X            | NOAA, NASA              | continental rainfall                         |
| KWAJEX              | 1999        | Kwajalein Island         | C            | NOAA/NASA               | tropical rain                                |
| Nauru-99            | 1999        | Pacific Ocean            | M,C          | DOE                     | tropical clouds and rain                     |
| JASMINE             | 1999        | Indian Ocean             | M,C          | NASA                    | monsoon clouds                               |
| INDOEX              | 1999        | Indian Ocean             | C            | NOAA/NSF                | oceanic rainfall                             |
| MWISP               | 1999        | Mt. Washington, NH       | K, X         | FAA                     | aircraft icing                               |
| Coast Guard         | 1998-9      | Atlantic & Caribbean     | D            | DOD                     | data system devel., ocean features, icebergs |
| BRIE                | 1998        | Erie, CO                 | K            | NOAA                    | clouds and absorption of radiation           |

|               |        |                         |       |                           |                                   |
|---------------|--------|-------------------------|-------|---------------------------|-----------------------------------|
| TRMM          | 1998   | Houston, TX             | X     | NASA                      | rainfall                          |
| CALJET        | 1997   | two sites northern CA   | 2S    | NOAA                      | coastal and orographic rain       |
| SHEBA         | 1997-8 | Arctic Ocean            | M     | NSF, NOAA, NASA           | Arctic clouds                     |
| FIRE-III      | 1998   | Arctic Ocean            | M     | NASA                      | Arctic clouds, satellite cal/val. |
| DIPOLE        | 1998   | Erie, CO                | K     | FAA                       | aircraft icing                    |
| RAIN-X        | 1997   | Erie, CO                | X     | NOAA                      | rainfall                          |
| ARM           | 1997   | Lamont, OK              | K     | DOE                       | cirrus & stratus clouds           |
| FASTEX        | 1996-7 | North Atlantic Ocean    | S     | NSF                       | oceanic winter storms             |
| SNOWRAD       | 1996   | Erie, CO                | K, X  | NOAA                      | snowfall                          |
| COPE          | 1995   | Arch Cape, OR           | K, X  | DOD                       | ocean dynamics                    |
| Arizona Prog. | 1995   | Cottonwood, AZ          | K, X  | NOAA, Arizona             | orographic winter storms          |
| BOREAS        | 1994   | Thompson, Manitoba      | K     | NOAA                      | boundary layer fluxes & clouds    |
| WISP          | 1994   | Erie, CO                | K     | FAA                       | aircraft icing                    |
| SCOPE         | 1993   | San Clemente Island, CA | X     | DOD                       | ocean waves and currents          |
| NDTE          | 1993   | Bismarck, ND            | X     | NOAA, N. Dakota           | thunderstorms                     |
| WISPIIT       | 1993   | Platteville, CO         | K     | FAA                       | aircraft icing, winter storms     |
| ASTEX         | 1992   | Madeira Ils., Portugal  | K     | NOAA, NASA, DOE           | marine stratus clouds             |
| FIRE-II       | 1991   | Coffeyville, KS         | K     | NOAA                      | cirrus clouds                     |
| WISP          | 1991   | Erie, CO                | K, X  | FAA                       | aircraft icing                    |
| CLARET-II     | 1991   | Erie, CO                | X     | DOE                       | cirrus clouds                     |
| LOWS          | 1990   | Lacona, NY              | X     | Niagara Mohawk Corp.      | lake effect winter storms         |
| CLARET        | 1989   | Erie, CO                | X     | NOAA                      | cirrus clouds                     |
| NDTP          | 1989   | Bismarck, ND            | X     | NOAA, N. Dakota           | transport & diffusion in clouds   |
| 3CPO          | 1988   | Champaign, IL           | X     | Electric Power Res. Inst. | venting by cumulus clouds         |
| CINDE         | 1987   | Denver, CO              | 2X    | NOAA                      | microbursts & convergence lines   |
| MesoGamma     | 1986   | Denver, CO              | 2X    | NOAA                      | convective storms                 |
| SCCCAMP       | 1985   | Santa Barbara, CA       | 2X    | DOI, MMS                  | marine boundary layer airflow     |
| Utah Wx Mod.  | 1985   | Beaver, UT              | K     | NOAA, State of Utah       | orographic winter storms          |
| New Mexico TE | 1984   | Socorro, NM             | NSF   | 2X                        | cloud electrification             |
| Phoenix-II    | 1984   | Erie, CO                | X     | ARO, NOAA                 | boundary layer flow               |
| Maypol        | 1983   | Denver, CO              | X     | NOAA                      | upslope storms                    |
| Direct Course | 1982   | White Sands, NM         | K     | DOD                       | simulation of nuclear blast       |
| CONDORS       | 1982   | Erie, CO                | X     | DOE                       | boundary layer plumes             |
| CCOPE         | 1981   | Miles City, MT          | K, 2X | NOAA                      | cumulus clouds & thunderstorms    |