



## How's It Made: Fireworks fascinate, but not for amateurs

Firework displays have become a common component of celebrations worldwide. They mark grand openings of businesses, signify American independence on July 4th, light up boardwalks during summer tourist season, and even commemorate birthdays and other special events.

While sitting awestruck watching a fantastic firework display, have you ever wondered the science behind those brilliant flashes of color and deafening "booms" in the night sky? If so, here's a brief description of the chemistry behind firework displays.

### Brilliant stars

Creating fireworks that display certain colors and patterns is intricate work requiring art expertise and knowledge of physical science. The three main components of firework "stars"

(the points of light given off) are an oxygen producer, fuel binder (to keep the parts



red, turn to orange, yellow, and eventually white light at extreme temperatures. Firework temperatures are carefully controlled to emit the right shade.

Luminescence is light that is formed from methods other than heat. To produce luminescence, energy is absorbed by an electron of an

atom or molecule, causing it to become excited, but unstable. When the electron returns to a lower energy state the energy is released in the form of a photon (light). The energy of the photon determines its wavelength, or color. Additionally, other substances – salts – need to be mixed in to form desired colors. They may need to be balanced out with other components to make sure the firework will remain stable until it is lit.

To create colors, some components used in fireworks include copper, which produces a blue flame; strontium to make a red one; and burning charcoal to create golden sparks. The chemicals are mixed together, usually into balls, that form the stars when firework is ignited.

### Packaging

Pyrotechnicians use different sizes and groups of stars and put them into a shell, the tube that holds the chemical balls, to make thousands of different effects. The stars may be mixed according to size and color and are usually packed in between rings of black powder explosive and charges. A fuse will be included to start the detonation. The entire shell is wrapped in brown paper and sealed.

At the scene of the firework display, the shells are placed in hollow tubes that are dug into sand or attached to another type of housing. Thousands of shells will be used depending upon the intricacy of the firework display.

### Finished product

Today, most of the larger firework displays are controlled by a computer board

programmed so the ignition of fuses is timed to clues from song accompaniment. This way fireworks will launch and explode at the right moments for ultimate drama.

### Safety

It is important to note that professional firework displays are handled by pyrotechnicians skilled and knowledgeable of the science behind

fireworks. Amateurs should never attempt to build fireworks, which can be unstable and dangerous.

## Showboat, food shelf team up for season

Mississippi Melodie Showboat Inc. has teamed up with the Food Shelf in Grand Rapids to help with a drive for additional supplies.

Volunteers from the Food Shelf will be on hand at the Showboat site at each of the performances to collect donations of cash, canned

goods, or boxed food items. Visitors to Showboat are encouraged to bring an item or two when they attend the show. All donations are tax deductible.

Show dates are July 14,15,16, 21,22,23, and 28,29,30. Shows this year begin at 8:30 p.m.

**30'x40'x10' Pole Building**  
**\$9,400**

- Residential
- Commercial
- Pole Houses

Materials, Installation & Tax  
 Includes 16'x8' overhead door, 36' service door, screwed roof & side walls, 5' footings 42lb. snow load & choice of color

**VON GROSS POLE BUILDINGS**  
 Lic. #20408955 218-927-2408 • 877-331-7671

**MIDAMERICA MORTGAGE CORPORATION**

**Lynn Mittelsteadt**  
 Mortgage Consultant

Local: 218-927-3911  
 Toll Free: 877-741-6621  
 Email: lynn@midamericamortgage.com  
 ~ Serving All of Minnesota ~

**Bat Man**  
**Rollie King**  
 Chemical Free, Non-Lethal Bat Exclusion  
 Since 1993 • Work Guaranteed

**Attic Restoration**  
 (Insulation Removal)

37486 170<sup>th</sup> Street  
 Frazee, MN 56544

218-847-6941  
 Cellular 218-841-2264  
 Toll Free 1-888-840-7378

**Hopper's Helpers Service Directory**

To add your business to the Hopper's Helpers Service Directory, contact the NEWSHOPPER at 218-927-6990, 1-800-927-4498, fax: 218-927-6980 or e-mail: hopper@emily.net

### Advertising/Newspaper/Shopper

NEWSHOPPER 218-927-6990 • 800-927-4498  
 Best Things in Life are FREE! 25,000+ average circulation. Classified Ads, Display Ads & Inserts  
 www.NewsHopper.net tfn

### Air Conditioning & Heating

**Ken's Heating & Mobile Home Supply**  
 LP & Natural Gas • Nationally Certified Service Technician – 30 Years Experience Residential & Commercial • Mobile Home Heating and Air Conditioning • RV's/Supplies  
 1-888-989-6720 • Aitkin w39

**Northern Air Plumbing & Heating • 218-927-6828**  
 New Construction, Remodeling, Turbo Soft Water, Carrier, Venmar. VanEE/AVS • naph@mlecmm.net w39

### Appliance Repair

**Jim Blakesley Appliance Repair & Service**  
 218-927-2027 • 1-888-450-8845 • Aitkin  
 Washers, Dryers, Stoves, Refrigerators, Air Conditions, Septic Protectors, and MORE.  
 I Repair Almost Anything That Is Broken tfn

### ATV/Motorcycle/Recreational

**Farm Island Repair and Marine • 218-927-6395**  
 YAMAHA ATV's and Rhinos - New and Used.  
 Sales • Accessories • Service All Brands. w41

### Banking

**Security State Bank • 218-927-3765 Main Bank**  
 218-927-3150 County Market Branch  
 24 Hr. Phone banking 218-927-4192  
 www.ssbmn.com Four locations to serve you. w39

### Boat & Marine

**Farm Island Repair and Marine • 218-927-6395**  
 YAMAHA ATV's and Rhinos - New and Used.  
 Sales • Accessories • Service All Brands. w41

### Building Supplies

**Aitkin Hardwoods • 1-888-927-6515**  
 T & G Paneling • Moulding • Millwork • Doors  
 Windows • Cabinets • Flooring • Lumber w39

**Countryside Millwork • 218-768-4083**  
 Doors, windows, lumber, siding, materials, flooring, firepalces. We Work for YOU! w39

**Hometown Building Supplies**  
 Your Building Materials Headquarters • Aitkin  
 218-927-7077 • Mon. - Fri. 8-5:30, Sat. 8-3 tfn

### Carpenter/Handyman

**Carpenter/Handyman • 218-927-6086 or 218-927-5366**  
 Remodeling • Additions • Flooring • Decks  
 Garages • Siding • Roofing • FREE Estimates w29

### Cellular Phones & Service

**SPRINT PCS** Available at the NewsHopper • Aitkin  
 218-927-6990 • No Roaming • Never Pay Huge Overages • Enjoy LIVE TV, Wireless Music Downloads, Play Games & Access Web tfn

### Concrete Production

**Concrete & Masonry Associates**  
**Concrete & Masonry Associates, Inc. -**  
 Block • Brick • Stone • Flat Work • FREE Estimates  
 Carl Kurtz, Aitkin 218-927-6627  
 Randy Slette, Baxter 218-829-5740 w38

**Customix Concrete • 320-676-1500**  
 Quality Concrete Mixed Fresh on Site  
 Pay only for what you use • Precast Storm Shelters, Boat Ramp Planks, Frost Pillars, Parking Curb Block tfn

### Concrete Production

**M & M Masonry • 218-678-2764**  
 Insulated poured walls, flat work with printing and staining. Tile and cultured stone. Glass block. w38

**Progressive Poured Walls • 218-927-2648**  
 Standard or Insulated Poured Walls, Concrete Homes, Concrete Pumping. w38

### Contractors

**Von Gross Pole Buildings**  
 Lic. #20408955 • 218-927-2408 • 877-331-7671 w3

**Westerlund Custom Builders, Inc.**  
 • New homes and buildings • Roofs, decks, etc.  
 #20216038 • Neil Westerlund 1-877-723-6716 w70s

### Custom Framing

**Nord Lake Reflections**  
 217 Minnesota Ave. N., Aitkin • 218-927-3317  
 Framing • Gifts • Prints tfn

### Dry Cleaning

**Anderson Cleaners • 218-829-5269**  
 Three locations to meet your dry cleaning needs. Holder Drug in Aitkin; Shirl's Sewing in Crosby and Snyder Drug in McGregor. w49

### Drywall

**JB Drywall • 320-684-2206**  
 Cell 651-270-4720 w38

**Larson Drywall Inc. • 218-927-3707**  
 Licensed, Insured & Bonded  
 Free Estimates w33

### Electricians

**ERIC WADE ELECTRIC • 218-927-2928**  
 Residential & Commercial • Master Electrician  
**NO JOB TOO SMALL • FREE ESTIMATES**  
 Licensed • Bonded • Insured Cell 651-341-0784 w43

### Excavating

**John Benson Excavating • Septic Systems,**  
 Building Site Prep, Demolition, Backhoe, Dozer, Track Skidsteer Work. Black Dirt & Fill. 218-678-3031 or 218-821-8719 w44

**Integrity Excavating**  
**Full Excavating:** Bobcat work, Demo, Dirt hauling, Fill, Grading, Driveways and more. **NO JOB TOO SMALL • FREE ESTIMATES • 218-851-7597** w44

### Flooring Materials & Installation

**Hudrlik Carpet & Tile • 218-927-6633**  
 Best price and quality for over 57 years,  
 Easy as A.B.C. Aitkin • Baxter • Crosby w39

### Furniture

**Aitkin Furniture • 218-927-2617**  
 for all of your furniture & flooring needs.  
 FREE estimates & delivery 1-800-543-7214 w39

### Glass

**Aitkin Glass Service**  
 36770 - 390th Ave., Aitkin  
 218-927-4624 • 800-958-6442  
 Auto • Residential • Commercial Glass Installation tfn

### Home Video Transfer

**C-I Video Production • 800-622-8222 • 218-545-1078**  
**Preserve your precious memories.** Transfer your home movies, pictures, slides and VHS to DVD; 16mm, 8mm, camcorder tapes, other media. Duplication of CD's and DVD's w27



# Computer-assisted knee surgery at Riverwood

The most advanced breakthrough in total knee-replacement surgery today is now being performed at Riverwood Healthcare Center. Leo Chough, MD, is among the first orthopedic surgeons in the country to bring sophisticated computer-assisted surgical navigation into performing knee joint replacement procedures.

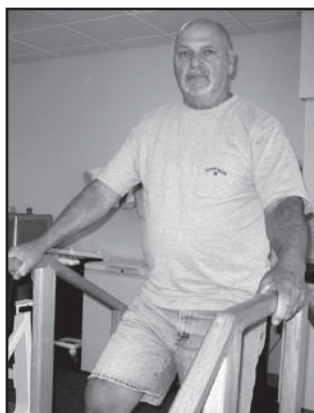
Computer-assisted surgical navigation techniques complement the physician's hands-on surgical skills with computerized accuracy, allowing the surgeon to "see" inside the patient before making any incisions. Electromagnetic tracking navigation uses miniaturized trackers that are placed directly inside the incision, eliminating additional trauma. The result is similar to the satellite navigation that tracks a vehicle's location and helps

guide the driver to a chosen destination.

"This new computer technology gives me a roadmap to navigate a patient's knee with incredible precision," explains Dr. Chough. "Providing a three-dimensional view, the technology allows a surgeon to align the patient's bone and joint implants with a degree of accuracy not possible with the naked eye. This is amazing technology that will soon become the standard for joint replacements."

Various types of imaging—including x-ray, computed tomography (CT) and "imageless" or computer-rendered—are used prior to surgery to plan and map out the procedure in three dimensions. The system merges the images so that during the actual surgery, the surgeon has a virtual reference.

Dr. Chough says there are many benefits for the patient. Combining minimally invasive surgical technique



Bill Quiel was the first Riverwood patient to undergo the new computer-navigated procedure.

with the computer-assisted surgery, knee-replacement patients will have smaller incisions, less tissue trauma

and less scarring. They'll also have faster and less painful rehabilitation and shorter hospital stays.

Since April 2007, Dr. Chough has performed all knee replacement surgeries at Riverwood using the new computer-assisted technique. Bill Quiel, who was suffering from growing, acute pain in his knees due to osteoarthritis, became the first patient to have the new surgical procedure at Riverwood on April 24.

Two months later, 65-year-old Quiel reports that recovery from his right knee replacement surgery—his first surgery ever—is going very well. "I'm coming along real good with just a little discomfort in my right knee and no pain at all in my left knee," Quiel says. "My right knee had become bowed and was putting stress on my

left knee, causing pain that could no longer be relieved with medication."

With arthritis, there can be mild, moderate or severe deformity, such as bowing of the knee that Bill Quiel experienced, Dr. Chough explains. "Greater deformity can happen from more bone wearing away," he adds. "Computer-assisted surgery uses at least 14 points of reference from the bones, which increases the accuracy of implant placement compared to traditional surgery."

Quiel says he woke up from surgery feeling relaxed with no pain. "During my three-day hospital stay the nursing staff at Riverwood were all extremely kind," he adds. "I was amazed at how fast I was able to get back on my feet. I went from using a walker for just three days to using a cane for two weeks

to walking on my own."

After five weeks of outpatient physical therapy, Quiel continues his rehab with stretching exercises that he does on his own at home. He lives with his wife, Sandra, near Aitkin and is looking forward to returning to work at his plant maintenance job at the Brainerd-area Fleet-Farm in a few weeks.

Also called image-guided surgery (IGS), computer-assisted surgical navigation has been used with great success in other medical specialties including neurosurgery, spine surgery, and ear, nose and throat surgery. This computer-assisted system for joint replacement surgery was developed by Zimmer, a leading surgical products company, and Medtronic, a global leader in medical technology headquartered in Minneapolis.

**Countryside Millwork and Building Center**  
 We work for YOU!  
**218-768-4083 • McGregor, MN**  
 ~ Newly Expanded Hardware ~  
 Doors ~ Windows ~ Lumber ~ Siding  
 Shingles ~ Building Materials  
 Cabinets ~ Paint ~ Decking ~ Flooring  
 Fireplaces ~ Wood Furnaces

**SEAMLESS RAIN GUTTERS**  
 Available in... ALUMINUM • PVC COATED ALUMINUM • COPPER  
**NO Seams - NO Leaks**  
 TERRY BOYES  
 INSURED & BONDED  
**CALL: 218-768-4231**  
**218-839-9728**

Would like to get an immediate \$100 off on your collision deductible? Give me a call to find out how.  
 Allstate offers a wide range of insurance, auto, home, recreation, business, classic cars & boats  
**Mark D. Larson**  
 204 2nd St. NW, Aitkin, MN 56431  
**218-927-9936 or 800-358-2564**  
 Hours:  
 8:30 - 5:30 Mon. - Fri.  
 8:30 - 12:00 Saturday  
 Evening by appointment  
  
**Allstate.**  
 You're In good hands.

# Hopper's Helpers Service Directory

To add your business to the Hopper's Helpers Service Directory, contact the NewsHopper at 218-927-6990, 1-800-927-4498, fax: 218-927-6980 or e-mail: hopper@emily.net

**Landscaping • Lawn Services**  
  
**R & R Landscaping & Tree Removal • 218-927-2855**  
 For all your excavating and landscaping needs. Patios, Boulder Walls, Rip Rap Rock, Sod, Class 5, Driveways, Building Pads, Basements, Road Building, Black Dirt, Sand, Gravel. For FREE estimates call Greg 218-839-3371 or 218-927-2855; www.randrtrl.com w36

**Nelson Lawn & Landscape • 218-927-3891**  
 Bobcat work • Retaining walls • Shoreline rock • Sod Seeding • Flagstone walks • Patios • Fill work • Black dirt • Class 5 • Sand • FREE ESTIMATES Fully insured w28

**Manufactured Homes**  
**Cedar Creek Homes Inc. • 1-800-834-3378**  
 Over 8 acres of new/used manufactured and modular homes • over 40 to choose from. w39

**Mortgage Services**  
 www.timberland-mortgage.com  
 Timberland Mortgage Services, Inc.  
 Purchases • Refinance • Reverse Mortgages  
 For current rates & loan information see website or call 1-800-311-4554, Peter w48

**Nursery**  
  
**Gilby's Nursery & Orchard**  
 #1 choice for fruit trees, container grown trees & small fruit. 218-768-4347 Cell: 612-201-9887 www.gilbysnursery.com w38

**Pet Care Service**  
**DOGPATCH • 218-927-4353**  
 Expert Pet Grooming & Boarding Services. West of Aitkin on Cedar Brook Rd. tfn

**Plumbing & Heating**  
**GRAVELLE PLUMBING & HEATING • 218-927-2624**  
 Air Conditioning & Ventilation. Sales • Heating • Installations • Service • Lennox • Burnham • Wirsbo w39

**Pole Buildings**  
**Von Gross Pole Buildings**  
 Lic. #20408955 • 218-927-2408 • 877-331-7671 w3

**Printers/Printing**  
**Lakeland Printers • 320-676-3167**  
 Full color / black and white copies • Auction bills  
 Specialize in single and multi-colored inserts w12os

**Property Maintenance**  
  
 Painting, Staining, Power Washing, Lawn-care, Property Maintenance, Cleaning & More...Call Mike 218-820-0142 w40

**Roofing**  
**A-1 Roofing • 218-678-2089**  
 Commercial & Residential  
 40+ Years Experience w39

**Septic Service**  
**Kangas Enterprises, Inc. • 1-218-768-2575**  
 Septic Pumping • Portable Toilets • Septic Systems  
 Excavating • CCTV Sewer Line Camera Lic. #2526 w39

**Siding Contractors**  
**A-1 Roofing • 1-218-678-2089**  
 Windows • Siding • Roofing • Soffit • Fascia • Vinyl Steel • Aluminum • Wood • Brands: Rollex, Emco  
 FREE ESTIMATES, Licensed & Insured w40

**Hoppers Helper's Service Directory lists businesses that are ready to help you!**

**Steel Buildings**  
  
**Rigid Steel Buildings • 218-831-1504**  
 30' x 40' to 100' x 300'  
 We deal on Bigger Buildings! w43

**Tattooing**  
**Skin Deep Tattoo • 218-927-1400**  
 Portraits by Josh on Paper or Skin. GIFT CERTIFICATES AVAILABLE  
 Old, faded tattoos reworked or covered up with new designs-sharp lines-bright colors. 30 years experience.  
 Hawaiian-Custom-one of a kind art. Wed.-Fri. 2pm-7pm; Sat. 10am-5pm • Corner of Hwy. 169 & 210 in Aitkin tfn

**Television Service**  
**Enberg's TV Since 1954 • 218-927-2988**  
 Dish Network, Antenna, Tower and TV  
**HD TV Zenith, LG & Toshiba • 1-888-ENBERGS w39**

**Tree Removal**  
**Northern Tree Specialists • 218-851-4781**  
 Hazardous Tree Removal • Free Trimming • Bolting & Cabling • Cracked Limb Support • Lot/Land Cleaning  
 • 24 Hour Storm Damage Service • Fully Insured • FREE ESTIMATES • 866-336-3956 w49

**R & R Landscaping & Tree Removal**  
**218-927-2855** • Tree Removal, Stump Grinding, Storm Damage Cleanup, Aerial Truck, Land & Lot Clearing, Trail Brushing, Ditch Cleaning. For FREE estimates 218-839-3371 or 218-927-2855; www.randrtrl.com w36

**Tree Removal**  
**Kokesh Stump Tree Removal • 218-927-2745**  
 Expert, Cost-Efficient Service • Safe Removal of Stumps, Trees and Other Wood Waste • Stump Grinding w38

**Water / Well Drilling**  
**North Star Water Wells • 218-829-0892**  
 Water Well Drilling & Pump Service  
 FREE ESTIMATES • 1-888-829-0892 w39

**Website Design & Hosting**  
  
**Website Design & Hosting • DVD Production**  
**Macintosh Technical Support & Software Training**  
 http://www.tadpolemedia.com 218-678-2910 w41

**Windows**  
**BetterLiving Concepts • 1-888-824-5551**  
 Renewal by Andersen • Replacement windows & doors • (BetterLiving) sunrooms w39

**Window Coverings**  
**Shades & Shutters Window Treatment**  
 Sales & Installation, call Wendie for consultations 218-927-4904 or 218-838-3514 w40

**SERVICE DIRECTORY RATES**  
 5 lines for \$10.00 per week  
 4 lines for \$8.00 per week  
 3 lines for \$6.00 per week  
**Special: Take 25% off with a 26 week commitment**

**Your Business Category**  
 To add your business to the Hopper's Helpers Service Directory, contact the NewsHopper at 218-927-6990, 1-800-927-4498, fax: 218-927-6980 or e-mail: hopper@emily.net