Using AMSFonts with the AASTeX Macros

May 1995

The more interesting American Mathematical Society fonts and symbols for astronomical purposes are shown below. Authors are invited to use these fonts and symbols in their AASTeX manuscripts. If the AMS fonts and symbols have not been installed locally it is still possible to use them in manuscripts that will be submitted electronically—the local copy of the manuscript will not contain these fonts but the copies produced at the editorial offices and at the Production Offices will be correct.

The AMS fonts and symbols may be obtained by anonymous FTP to the node `ftp.shsu.edu` in the directory `tex-archive/fonts/ams`. The fonts and symbols displayed on these pages were extracted from the **User's Guide to AMSFonts Version 2.1**.

There are four symbols that are normally used outside of math mode:

✓	`\checkmark`	®	`\circledR`
✠	`\maltese`	¥	`\yen`

These symbols can also be used in math mode, and will change sizes correctly in subscripts and superscripts.

There are four symbols that are "delimiters" (although there are no larger versions obtainable with `\left` and `\right`), so they must be used in math mode:

$\ulcorner$	`\ulcorner`	$\urcorner$	`\urcorner`
$\llcorner$	`\llcorner`	$\lrcorner$	`\lrcorner`

There are two dashed arrows constructed from symbols in this family (note that one of them has two names; it can be accessed by either one):

$\dashrightarrow$	`\dashrightarrow`, `\dasharrow`	$\dashleftarrow$	`\dashleftarrow`

Wider versions of `\widehat` and `\widetilde` are available.

Letters in the EUFM font can be accessed (in math mode) by typing, for example, `\frak A \frak g` to get $\mathfrak{A}\mathfrak{g}$. The complete Euler Fraktur upper and lower case alphabet is listed here: $\mathfrak{A}$, $\mathfrak{B}$, $\mathfrak{C}$, $\mathfrak{D}$, $\mathfrak{E}$, $\mathfrak{F}$, $\mathfrak{G}$, $\mathfrak{H}$, $\mathfrak{I}$, $\mathfrak{J}$, $\mathfrak{K}$, $\mathfrak{L}$, $\mathfrak{M}$, $\mathfrak{N}$, $\mathfrak{O}$, $\mathfrak{P}$, $\mathfrak{Q}$, $\mathfrak{R}$, $\mathfrak{S}$, $\mathfrak{T}$, $\mathfrak{U}$, $\mathfrak{V}$, $\mathfrak{W}$, $\mathfrak{X}$, $\mathfrak{Y}$, $\mathfrak{Z}$, and $\mathfrak{a}$, $\mathfrak{b}$, $\mathfrak{c}$, $\mathfrak{d}$, $\mathfrak{e}$, $\mathfrak{f}$, $\mathfrak{g}$, $\mathfrak{h}$, $\mathfrak{i}$, $\mathfrak{j}$, $\mathfrak{k}$, $\mathfrak{l}$, $\mathfrak{m}$, $\mathfrak{n}$, $\mathfrak{o}$, $\mathfrak{p}$, $\mathfrak{q}$, $\mathfrak{r}$, $\mathfrak{s}$, $\mathfrak{t}$, $\mathfrak{u}$, $\mathfrak{v}$, $\mathfrak{w}$, $\mathfrak{x}$, $\mathfrak{y}$, $\mathfrak{z}$.

- **Lowercase Greek letters**

$\digamma$	`207A \digamma`	$\varkappa$	`207B \varkappa`

- **Hebrew letters**

$\beth$	`2069 \beth`	$\gimel$	`206A \gimel`
$\daleth$	`206B \daleth`		

- **Miscellaneous symbols**

$\hbar$	207E	\hbar (U)	$\backprime$	1038	\backprime
$\hslash$	207D	\hslash	$\varnothing$	203F	\varnothing
$\vartriangle$	134D	\vartriangle	$\blacktriangle$	104E	\blacktriangle
$\triangledown$	104F	\triangledown	$\blacktriangledown$	1048	\blacktriangledown
$\square$	1003	\square	$\blacksquare$	1004	\blacksquare
$\lozenge$	1006	\lozenge	$\blacklozenge$	1007	\blacklozenge
$\circledS$	1073	\circledS	$\bigstar$	1046	\bigstar
$\angle$	105C	\angle (U)	$\sphericalangle$	105E	\sphericalangle
$\measuredangle$	105D	\measuredangle			
$\nexists$	2040	\nexists	$\complement$	107B	\complement
$\mho$	2066	\mho	$\eth$	2067	\eth
$\Finv$	2060	\Finv	$\diagup$	231E	\diagup
$\Game$	2061	\Game	$\diagdown$	231F	\diagdown
$\Bbbk$	207C	\Bbbk			

- **Binary operators**

$\dotplus$	1275	\dotplus	$\ltimes$	226E	\ltimes
$\smallsetminus$	2272	\smallsetminus	$\rtimes$	226F	\rtimes
$\Cap$	1265	\Cap, \doublecap	$\leftthreetimes$	1268	\leftthreetimes
$\Cup$	1264	\Cup, \doublecup	$\rightthreetimes$	1269	\rightthreetimes
$\barwedge$	125A	\barwedge	$\curlywedge$	1266	\curlywedge
$\veebar$	1259	\veebar	$\curlyvee$	1267	\curlyvee
$\doublebarwedge$	125B	\doublebarwedge			
$\boxminus$	120C	\boxminus	$\circleddash$	127F	\circleddash
$\boxtimes$	1202	\boxtimes	$\circledast$	127E	\circledast
$\boxdot$	1200	\boxdot	$\circledcirc$	127D	\circledcirc
$\boxplus$	1201	\boxplus	$\centerdot$	1205	\centerdot
$\divideontimes$	223E	\divideontimes	$\intercal$	127C	\intercal

- **Binary relations**

$\leqq$	1335	\leqq	$\geqq$	133D	\geqq
$\leqslant$	1336	\leqslant	$\geqslant$	133E	\geqslant
$\eqslantless$	1330	\eqslantless	$\eqslantgtr$	1331	\eqslantgtr
$\lesssim$	132E	\lesssim	$\gtrsim$	1326	\gtrsim
$\lessapprox$	132F	\lessapprox	$\gtrapprox$	1327	\gtrapprox
$\approxeq$	2375	\approxeq			
$\lessdot$	236C	\lessdot	$\gtrdot$	236D	\gtrdot
$\lll$	136E	\lll, \llless	$\ggg$	136F	\ggg, \gggtr
$\lessgtr$	1337	\lessgtr	$\gtrless$	133F	\gtrless
$\lesseqgtr$	1351	\lesseqgtr	$\gtreqless$	1352	\gtreqless
$\lesseqqgtr$	1353	\lesseqqgtr	$\gtreqqless$	1354	\gtreqqless
$\doteqdot$	132B	\doteqdot, \Doteq	$\eqcirc$	1350	\eqcirc
$\risingdotseq$	133A	\risingdotseq	$\circeq$	1324	\circeq
$\fallingdotseq$	133B	\fallingdotseq	$\triangleq$	132C	\triangleq

$\backsim$	1376	\backsim	$\thicksim$	2373	\thicksim
$\backsimeq$	1377	\backsimeq	$\thickapprox$	2374	\thickapprox
$\subseteqq$	136A	\subseteqq	$\supseteqq$	136B	\supseteqq
$\Subset$	1362	\Subset	$\Supset$	1363	\Supset
$\sqsubset$	1340	\sqsubset	$\sqsupset$	1341	\sqsupset
$\preccurlyeq$	1334	\preccurlyeq	$\succcurlyeq$	133C	\succcurlyeq
$\curlyeqprec$	1332	\curlyeqprec	$\curlyeqsucc$	1333	\curlyeqsucc
$\precsim$	132D	\precsim	$\succsim$	1325	\succsim
$\precapprox$	2377	\precapprox	$\succapprox$	2376	\succapprox
$\vartriangleleft$	1343	\vartriangleleft	$\vartriangleright$	1342	\vartriangleright
$\trianglelefteq$	1345	\trianglelefteq	$\trianglerighteq$	1344	\trianglerighteq
$\vDash$	130F	\vDash	$\Vdash$	130D	\Vdash
$\Vvdash$	130E	\Vvdash			
$\smallsmile$	1360	\smallsmile	$\shortmid$	2370	\shortmid
$\smallfrown$	1361	\smallfrown	$\shortparallel$	2371	\shortparallel
$\bumpeq$	136C	\bumpeq	$\between$	1347	\between
$\Bumpeq$	136D	\Bumpeq	$\pitchfork$	1374	\pitchfork
$\varpropto$	135F	\varpropto	$\backepsilon$	237F	\backepsilon
$\blacktriangleleft$	134A	\blacktriangleleft	$\blacktriangleright$	1349	\blacktriangleright
$\therefore$	1329	\therefore	$\because$	132A	\because

- **Negated relations**

$\nless$	2304	\nless	$\ngtr$	2305	\ngtr
$\nleq$	2302	\nleq	$\ngeq$	2303	\ngeq
$\nleqslant$	230A	\nleqslant	$\ngeqslant$	230B	\ngeqslant
$\nleqq$	2314	\nleqq	$\ngeqq$	2315	\ngeqq
$\lneq$	230C	\lneq	$\gneq$	230D	\gneq
$\lneqq$	2308	\lneqq	$\gneqq$	2309	\gneqq
$\lvertneqq$	2300	\lvertneqq	$\gvertneqq$	2301	\gvertneqq
$\lnsim$	2312	\lnsim	$\gnsim$	2313	\gnsim
$\lnapprox$	231A	\lnapprox	$\gnapprox$	231B	\gnapprox
$\nprec$	2306	\nprec	$\nsucc$	2307	\nsucc
$\npreceq$	230E	\npreceq	$\nsucceq$	230F	\nsucceq
$\precneqq$	2316	\precneqq	$\succneqq$	2317	\succneqq
$\precnsim$	2310	\precnsim	$\succnsim$	2311	\succnsim
$\precnapprox$	2318	\precnapprox	$\succnapprox$	2319	\succnapprox
$\nsim$	231C	\nsim	$\ncong$	231D	\ncong
$\nshortmid$	232E	\nshortmid	$\nshortparallel$	232F	\nshortparallel
$\nmid$	232D	\nmid	$\nparallel$	232C	\nparallel
$\nvdash$	2330	\nvdash	$\nvDash$	2332	\nvDash
$\nVdash$	2331	\nVdash	$\nVDash$	2333	\nVDash
$\ntriangleleft$	2336	\ntriangleleft	$\ntriangleright$	2337	\ntriangleright
$\ntrianglelefteq$	2335	\ntrianglelefteq	$\ntrianglerighteq$	2334	\ntrianglerighteq
$\nsubseteq$	232A	\nsubseteq	$\nsupseteq$	232B	\nsupseteq
$\nsubseteqq$	2322	\nsubseteqq	$\nsupseteqq$	2323	\nsupseteqq
$\subsetneq$	2328	\subsetneq	$\supsetneq$	2329	\supsetneq

$\varsubsetneq$	2320	\varsubsetneq	$\varsupsetneq$	2321	\varsupsetneq
$\subsetneqq$	2324	\subsetneqq	$\supsetneqq$	2325	\supsetneqq
$\varsubsetneqq$	2326	\varsubsetneqq	$\varsupsetneqq$	2327	\varsupsetneqq

- **Arrows**

$\leftleftarrows$	1312	\leftleftarrows	$\rightrightarrows$	1313	\rightrightarrows
$\leftrightarrows$	131C	\leftrightarrows	$\rightleftarrows$	131D	\rightleftarrows
$\Lleftarrow$	1357	\Lleftarrow	$\Rrightarrow$	1356	\Rrightarrow
$\twoheadleftarrow$	1311	\twoheadleftarrow	$\twoheadrightarrow$	1310	\twoheadrightarrow
$\leftarrowtail$	131B	\leftarrowtail	$\rightarrowtail$	131A	\rightarrowtail
$\looparrowleft$	1322	\looparrowleft	$\looparrowright$	1323	\looparrowright
$\leftrightharpoons$	130B	\leftrightharpoons	$\rightleftharpoons$	130A	\rightleftharpoons (U)
$\curvearrowleft$	2378	\curvearrowleft	$\curvearrowright$	2379	\curvearrowright
$\circlearrowleft$	1309	\circlearrowleft	$\circlearrowright$	1308	\circlearrowright
$\Lsh$	131E	\Lsh	$\Rsh$	131F	\Rsh
$\upuparrows$	1314	\upuparrows	$\downdownarrows$	1315	\downdownarrows
$\upharpoonleft$	1318	\upharpoonleft	$\upharpoonright$	1316	\upharpoonright, \restriction
$\downharpoonleft$	1319	\downharpoonleft	$\downharpoonright$	1317	\downharpoonright
$\multimap$	1328	\multimap	$\rightsquigarrow$	1320	\rightsquigarrow
$\leftrightsquigarrow$	1321	\leftrightsquigarrow			

- **Negated arrows**

$\nleftarrow$	2338	\nleftarrow	$\nrightarrow$	2339	\nrightarrow
$\nLeftarrow$	233A	\nLeftarrow	$\nRightarrow$	233B	\nRightarrow
$\nleftrightarrow$	233D	\nleftrightarrow	$\nLeftrightarrow$	233C	\nLeftrightarrow