

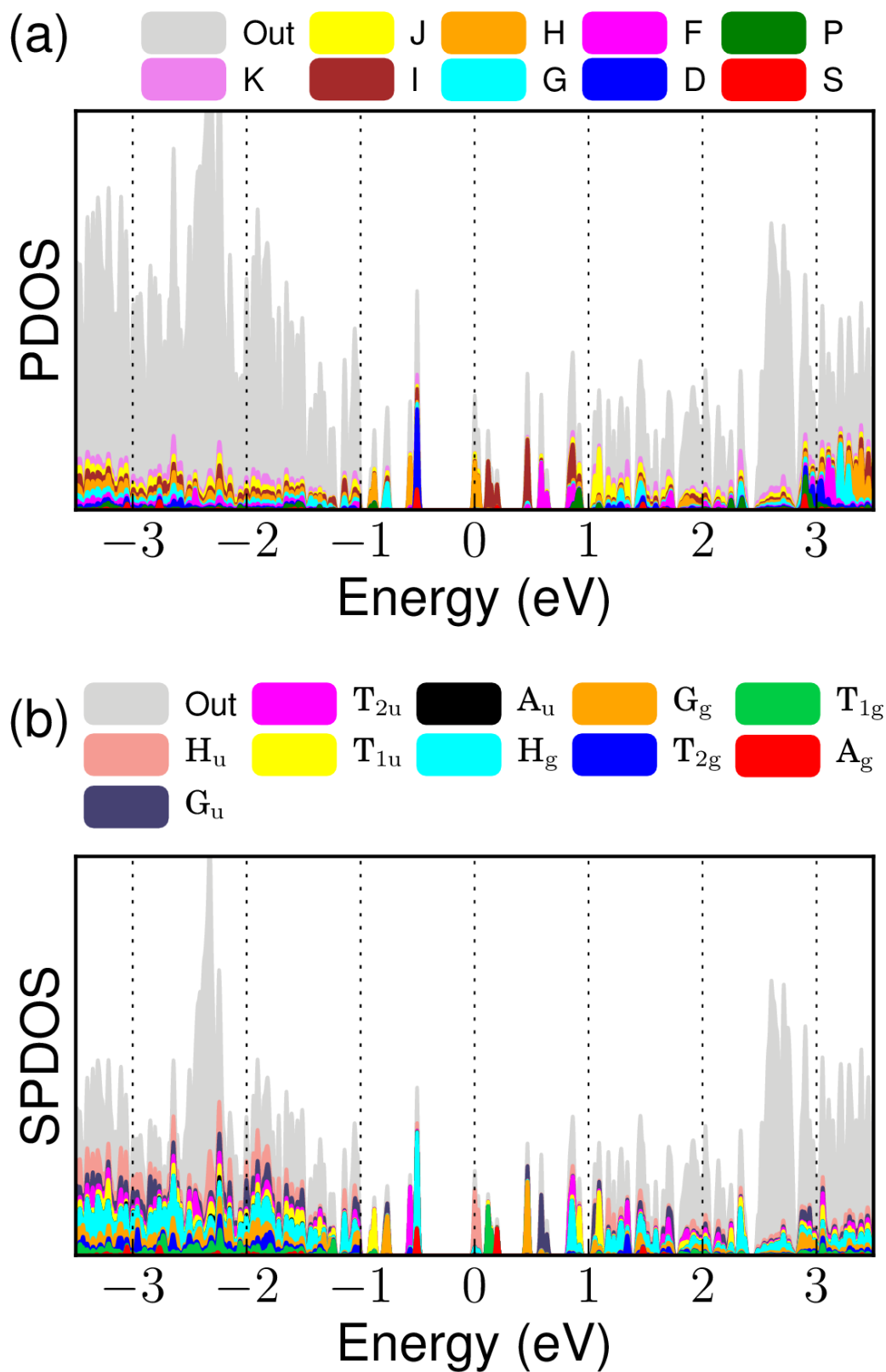
ELECTRONIC SUPPLEMENTARY INFORMATION (ESI) FOR

**CHIRAL FOOTPRINT OF THE LIGAND LAYER IN THE ALL-ALKYNYL-PROTECTED GOLD  
NANOCLUSTER Au<sub>144</sub>(CCPhF)<sub>60</sub>**

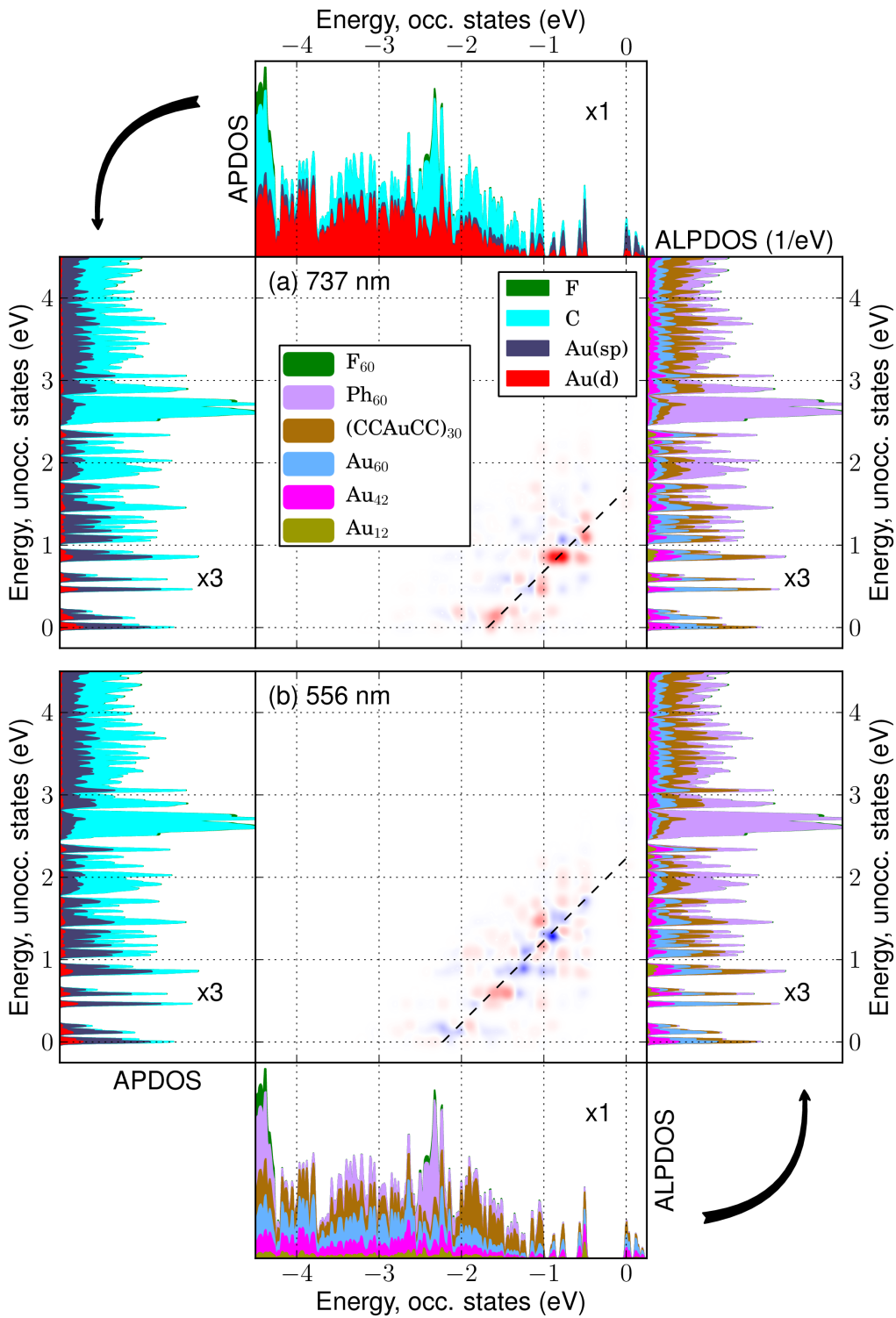
Sami Malola<sup>a</sup> and Hannu Häkkinen<sup>a,b,\*</sup>

<sup>a</sup> Department of Physics, Nanoscience Center, University of Jyväskylä, FI-40014 Jyväskylä, Finland

<sup>b</sup> Department of Chemistry, Nanoscience Center, University of Jyväskylä, FI-40014 Jyväskylä,  
Finland



**FIG. S1** Projection of the electron density of states (PDOS) of  $Au_{144}(CCPhF)_{60}$  cluster to (a) spherical harmonics and to (b)  $I_h$  symmetry group representations. The HOMO energy is set to zero and the states are broadened with 0.01 eV gaussian.



**FIG. S2** RTCM analysis of selected peaks (at 737 nm and at 556 nm) of the CD spectrum of  $\text{Au}_{144}(\text{CCPhF})_{60}$  shown in Fig. 2a. The red/blue spots denote constructive/destructive contributions to the rotational strengths. The single electron DOS is presented either as projected to local atomic orbitals (APDOS, bottom and right panels) or by layer-by-layer manner (ALPDOS, top and left panels). The dashed diagonal lines denote the electron-hole (e-h) energy equaling the peak position ( $\epsilon_e - \epsilon_h = hc / \lambda$ ). The HOMO energy is at zero.

**List of atomic coordinates of Au<sub>144</sub>(CCPhF)<sub>60</sub> (unit: Å)**

924 atoms

Au	12.850740	24.044474	22.605623
Au	15.708740	24.266474	23.276625
Au	16.794741	21.767473	23.952623
Au	18.327742	20.882473	21.641623
Au	15.878740	22.296474	21.263624
Au	17.473742	21.375473	19.076624
Au	14.998741	22.804474	18.558622
Au	14.982740	20.087475	19.566624
Au	13.187740	20.913473	17.579622
Au	13.170741	18.136475	18.588623
Au	11.261741	20.087475	19.566624
Au	12.841741	21.076473	14.671623
Au	14.759741	22.942472	15.749621
Au	15.887741	20.612474	16.846622
Au	15.683741	20.715473	14.042623
Au	18.246740	20.929474	15.165623
Au	17.109741	21.585474	11.626623
Au	19.706741	21.786474	12.922623
Au	19.706741	12.169474	22.605623
Au	18.085741	14.534473	23.276625
Au	19.706741	16.723475	23.952623
Au	19.706741	18.493473	21.641623
Au	19.706741	15.665473	21.263624
Au	19.706741	17.508472	19.076624
Au	19.706741	14.649472	18.558622
Au	22.068741	15.994474	19.566624
Au	22.250742	14.027473	17.579622
Au	24.663742	15.400475	18.588623
Au	23.928741	12.771475	19.566624
Au	22.281742	13.645473	14.671623
Au	19.706741	14.374474	15.749621
Au	21.160740	16.515474	16.846622
Au	21.173740	16.287474	14.042623
Au	19.706741	18.400475	15.165623
Au	19.706741	17.087475	11.626623
Au	18.234741	19.236473	12.922623
Au	26.563742	24.044474	22.605623
Au	25.325741	21.458473	23.276625
Au	22.619741	21.767473	23.952623
Au	21.086740	20.882473	21.641623
Au	23.535742	22.296474	21.263624
Au	21.939741	21.375473	19.076624
Au	24.414742	22.804474	18.558622

Au	22.069740	24.177473	19.566624
Au	23.682741	25.318474	17.579622
Au	21.285740	26.722473	18.588623
Au	23.930740	27.399473	19.566624
Au	23.996740	25.536474	14.671623
Au	24.653742	22.942472	15.749621
Au	22.072741	23.130474	16.846622
Au	22.263741	23.256474	14.042623
Au	21.166740	20.929474	15.165623
Au	22.303741	21.585474	11.626623
Au	21.178741	19.236473	12.922623
Au	12.850740	16.127474	16.523623
Au	15.708740	15.906472	15.852623
Au	16.794741	18.404474	15.176621
Au	18.327742	19.289474	17.487623
Au	15.878740	17.875473	17.864624
Au	17.473742	18.797474	20.051622
Au	14.998741	17.367474	20.569624
Au	13.187740	19.259474	21.549623
Au	13.170741	22.036474	20.540625
Au	12.841741	19.095474	24.457624
Au	14.759741	17.230474	23.379622
Au	15.887741	19.559473	22.282621
Au	15.683741	19.457474	25.086622
Au	18.246740	19.243473	23.963625
Au	17.109741	18.586473	27.501623
Au	19.706741	18.386475	26.205622
Au	19.706741	28.003473	16.523623
Au	18.085741	25.638474	15.852623
Au	19.706741	23.449472	15.176621
Au	19.706741	21.679474	17.487623
Au	19.706741	24.507473	17.864624
Au	19.706741	22.664474	20.051622
Au	19.706741	25.523474	20.569624
Au	22.250742	26.145473	21.549623
Au	24.663742	24.771475	20.540625
Au	22.281742	26.526474	24.457624
Au	19.706741	25.798471	23.379622
Au	21.160740	23.657475	22.282621
Au	21.173740	23.885473	25.086622
Au	19.706741	21.771475	23.963625
Au	19.706741	23.085474	27.501623
Au	18.234741	20.936474	26.205622
Au	26.563742	16.127474	16.523623
Au	25.325741	18.714474	15.852623
Au	22.619741	18.404474	15.176621
Au	21.086740	19.289474	17.487623

Au	23.535742	17.875473	17.864624
Au	21.939741	18.797474	20.051622
Au	24.414742	17.367474	20.569624
Au	23.682741	14.854472	21.549623
Au	21.285740	13.450474	20.540625
Au	23.996740	14.636475	24.457624
Au	24.653742	17.230474	23.379622
Au	22.072741	17.041471	22.282621
Au	22.263741	16.916471	25.086622
Au	21.166740	19.243473	23.963625
Au	22.303741	18.586473	27.501623
Au	21.178741	20.936474	26.205622
Au	23.704741	24.266474	23.276625
Au	24.430740	20.087475	19.566624
Au	26.225740	20.913473	17.579622
Au	26.242741	18.136475	18.588623
Au	28.152740	20.087475	19.566624
Au	26.571741	21.076473	14.671623
Au	23.526741	20.612474	16.846622
Au	23.730742	20.715473	14.042623
Au	21.327742	14.534473	23.276625
Au	17.345741	15.994474	19.566624
Au	17.163740	14.027473	17.579622
Au	14.749741	15.400475	18.588623
Au	15.484740	12.771475	19.566624
Au	17.131741	13.645473	14.671623
Au	18.253740	16.515474	16.846622
Au	18.239740	16.287474	14.042623
Au	14.087741	21.458473	23.276625
Au	17.343740	24.177473	19.566624
Au	15.731741	25.318474	17.579622
Au	18.127741	26.722473	18.588623
Au	15.483741	27.399473	19.566624
Au	15.416740	25.536474	14.671623
Au	17.340740	23.130474	16.846622
Au	17.149740	23.256474	14.042623
Au	23.704741	15.906472	15.852623
Au	26.225740	19.259474	21.549623
Au	26.242741	22.036474	20.540625
Au	26.571741	19.095474	24.457624
Au	23.526741	19.559473	22.282621
Au	23.730742	19.457474	25.086622
Au	21.327742	25.638474	15.852623
Au	17.163740	26.145473	21.549623
Au	14.749741	24.771475	20.540625
Au	17.131741	26.526474	24.457624
Au	18.253740	23.657475	22.282621

Au	18.239740	23.885473	25.086622
Au	14.087741	18.714474	15.852623
Au	15.731741	14.854472	21.549623
Au	18.127741	13.450474	20.540625
Au	15.416740	14.636475	24.457624
Au	17.340740	17.041471	22.282621
Au	17.149740	16.916471	25.086622
F	10.895831	24.300678	18.295597
F	19.904375	13.101474	10.099419
F	19.657461	18.496712	8.098169
C	10.966342	18.401941	18.444885
C	10.098611	17.825165	17.771652
C	9.142188	17.142004	16.993279
C	8.255647	17.802847	16.115385
C	7.346724	17.085907	15.343684
C	7.309342	15.689672	15.418054
C	8.169622	15.005715	16.281109
C	9.058008	15.737823	17.056190
C	10.555868	22.029306	16.723547
C	11.552710	21.503626	16.199921
C	9.455033	22.695181	17.301495
C	8.127367	22.244370	17.124413
C	7.051293	22.950853	17.648081
C	7.272898	24.135157	18.357544
C	8.572206	24.600842	18.568501
C	9.640289	23.872267	18.061022
C	12.471489	24.448580	14.229459
C	17.574757	14.676459	11.604777
C	17.481314	19.695757	10.890194
C	17.526064	18.861538	9.968348
C	18.541061	17.753923	7.983070
C	17.490351	17.913765	8.917871
C	16.368105	17.064289	8.756971
C	16.291174	16.146736	7.716232
C	17.339075	16.042767	6.795163
C	18.471521	16.844835	6.934471
C	12.605785	13.208602	17.811331
C	13.473017	27.414181	17.113874
F	11.694964	23.104040	11.900346
C	13.654126	24.497223	14.602711
C	11.125398	24.400620	13.809120
C	10.742999	23.720015	12.632133
C	9.425857	23.655731	12.199828
C	8.433470	24.290594	12.950941
C	8.770105	24.975574	14.122912
C	10.092983	25.028238	14.545815
C	21.974388	18.722242	10.031785

C	21.844286	14.538701	11.624354
C	21.930414	14.561727	12.863818
C	21.804390	14.543249	10.210651
C	22.743729	15.298275	9.469141
C	22.736254	15.314456	8.080606
C	21.782867	14.571347	7.377822
C	20.831053	13.825609	8.073236
C	20.847973	13.823935	9.461067
F	18.500757	21.103432	8.098087
F	13.895319	23.490692	10.098451
C	13.879423	21.052063	11.627163
C	13.814818	20.937040	12.863049
C	13.931055	21.098370	10.213331
C	14.011528	19.896111	9.469116
C	14.029798	19.894087	8.080562
C	13.968875	21.102549	7.379472
C	13.918333	22.309816	8.076486
C	13.912203	22.298548	9.465341
F	21.304316	20.696772	8.099533
C	21.209339	18.310436	10.921394
C	22.507080	20.096693	8.036574
C	22.860876	19.133114	9.009510
C	24.164007	18.587069	8.914391
C	25.034731	18.949492	7.893893
C	24.631203	19.877382	6.927775
C	23.364542	20.457905	7.004249
F	25.693195	23.507000	10.098195
C	25.468439	20.850517	11.624777
C	20.504738	22.282745	10.921453
C	19.789970	22.730858	10.008833
C	18.368570	22.437557	8.006061
C	18.999197	23.262434	8.965665
C	18.795387	24.656864	8.838626
C	18.031738	25.185783	7.804785
C	17.440487	24.335340	6.863794
C	17.605963	22.954027	6.966421
C	16.134569	24.656893	11.624054
C	23.527479	24.632442	11.628245
C	23.426279	24.743782	12.862147
C	23.553293	24.575520	10.214105
C	22.455109	25.069914	9.468454
C	22.446371	25.058914	8.080124
C	23.543249	24.548693	7.378684
C	24.637074	24.035406	8.076340
C	24.627171	24.042707	9.465016
F	20.500771	10.296344	18.097088
C	25.557753	13.366754	18.475351



C	26.552519	12.982388	17.840792
C	27.646082	12.526023	17.073997
C	27.501812	11.484029	16.129902
C	28.579441	11.050145	15.366598
C	29.832306	11.653853	15.514549
C	30.010090	12.687288	16.436159
C	28.927034	13.099391	17.201975
C	22.696255	11.196722	16.692055
C	22.603596	12.332767	16.199543
C	22.678495	9.900430	17.244074
C	23.758919	8.998591	17.118923
C	23.672892	7.704530	17.618183
C	22.502989	7.275929	18.254782
C	21.420897	8.145817	18.406830
C	21.527578	9.441902	17.922461
C	19.575312	11.659427	14.164742
C	29.235546	17.275511	17.884117
C	16.535368	11.018537	17.142845
F	21.297733	11.498419	11.901121
C	18.924351	12.645518	14.549391
C	20.281609	10.486697	13.805650
C	21.133703	10.411033	12.680817
C	21.827190	9.257440	12.341306
C	21.687790	8.117191	13.133933
C	20.851461	8.147120	14.254454
C	20.165697	9.309621	14.583342
F	27.702925	25.901976	18.493452
C	22.608000	28.500534	18.470091
C	22.530943	29.555754	17.822952
C	22.392080	30.740610	17.074013
C	23.366922	31.194153	16.159056
C	23.162165	32.347408	15.409491
C	21.977358	33.076763	15.550613
C	21.000570	32.666679	16.461325
C	21.225979	31.518684	17.208752
C	25.924902	27.108736	16.705524
C	24.986963	26.467813	16.202505
C	27.031834	27.805019	17.239233
C	27.299723	29.149984	16.896076
C	28.439777	29.799553	17.355589
C	29.345064	29.122047	18.178995
C	29.098312	27.802017	18.559912
C	27.950253	27.167124	18.103411
C	27.123823	24.174452	14.276557
C	17.391434	29.742785	17.862675
C	29.158535	21.833925	17.113604
F	26.503239	25.502222	11.899651

C	26.554771	23.125122	14.617420
C	27.778116	25.365458	13.897665
C	27.452944	26.033504	12.696541
C	28.072525	27.210478	12.302395
C	29.065031	27.756662	13.119476
C	29.421797	27.122814	14.314013
C	28.786852	25.948385	14.699341
C	14.004386	13.888552	14.234709
C	17.297569	28.056421	14.159362
C	27.926537	18.235651	14.241636
F	25.303295	15.500977	11.694376
C	25.594440	15.054932	15.082273
C	25.572056	14.278465	14.112609
C	25.550287	13.505387	12.933519
C	25.632969	12.095534	12.913399
C	25.633390	11.397012	11.711013
C	25.553892	12.084105	10.495049
C	25.455151	13.477181	10.479303
C	25.440205	14.155892	11.687850
F	21.099161	27.106157	11.694923
C	21.134886	27.708635	15.100850
C	21.851742	28.050486	14.146951
C	22.589561	28.399626	12.997713
C	23.748913	29.205450	13.035269
C	24.421511	29.545101	11.867229
C	23.953735	29.090467	10.630045
C	22.821671	28.274799	10.558744
C	22.171789	27.932138	11.734831
F	12.897415	17.497675	11.693419
C	12.394603	17.509579	15.095004
C	11.747209	17.935020	14.124126
C	11.097996	18.368540	12.950606
C	9.869976	19.067135	12.948125
C	9.265017	19.443888	11.754403
C	9.867082	19.135345	10.531289
C	11.092316	18.463150	10.497861
C	11.690159	18.109621	11.698678
F	17.905603	26.703377	11.294520
C	16.592478	23.542187	11.926189
C	14.890577	28.528275	10.448232
C	13.928342	27.537071	10.670660
C	14.309658	26.262135	11.074153
C	15.674871	25.938475	11.250453
C	16.607271	26.975594	11.051236
C	16.245644	28.251678	10.647248
F	14.894717	15.102256	11.294144
C	18.277678	15.652158	11.917473

C	14.931863	11.574206	10.452169
C	16.283937	11.282277	10.664478
C	17.167025	12.281652	11.056355
C	16.722370	13.611430	11.236282
C	15.347056	13.854897	11.049789
C	14.454062	12.871401	10.654838
F	26.497763	18.296518	11.294678
C	24.269365	21.020229	11.909698
C	29.491758	20.155390	10.457777
C	29.055817	21.462227	10.700216
C	27.747683	21.703543	11.106479
C	26.823631	20.643637	11.267419
C	27.320761	19.340467	11.060219
C	28.620375	19.082123	10.649895
F	12.898847	11.498734	15.091729
C	15.158088	14.184370	14.584738
C	12.705717	13.506308	13.841579
C	11.907094	14.302596	12.988382
C	10.636317	13.887909	12.606227
C	10.127924	12.665270	13.058197
C	10.892716	11.854630	13.901652
C	12.155131	12.284444	14.281266
F	15.892860	30.107067	15.245241
C	16.904642	26.937752	14.526914
C	17.625635	29.382771	13.813252
C	18.662321	29.735640	12.921466
C	18.912403	31.070625	12.618092
C	18.133718	32.083881	13.189057
C	17.104544	31.767197	14.079836
C	16.874342	30.433430	14.379276
F	30.500807	18.302330	15.288817
C	27.093927	19.095510	14.571952
C	28.896502	17.282757	13.864847
C	28.619982	16.244534	12.944890
C	29.598372	15.322545	12.589125
C	30.883854	15.412177	13.134193
C	31.189674	16.424971	14.046159
C	30.201359	17.332939	14.398817
F	31.302502	15.297439	17.901670
F	30.702158	23.902477	18.099985
C	28.023287	17.066444	17.689568
C	32.427223	19.244398	18.127203
C	31.077482	18.917992	18.074930
C	30.622307	17.579245	18.019398
C	31.638266	16.602163	18.011570
C	32.992405	16.904837	18.066425
C	33.395844	18.238415	18.124239

C	28.371702	21.228010	17.858103
C	31.900961	24.145977	16.080954
C	30.911602	23.516939	16.822849
C	30.116938	22.474447	16.301027
C	30.353518	22.092607	14.959776
C	31.326321	22.730505	14.198207
C	32.103912	23.751310	14.756019
F	9.892499	12.501875	17.902267
F	17.701385	8.696918	18.101151
C	12.982430	14.384120	17.653973
C	12.638552	9.452602	17.982004
C	13.075596	10.770487	17.927605
C	12.172640	11.858146	17.924488
C	10.808869	11.513593	17.964708
C	10.349021	10.205914	18.025867
C	11.273600	9.160744	18.035772
C	16.377983	12.013098	17.867846
C	17.274384	7.507319	16.108601
C	17.204775	8.680176	16.846476
C	16.624449	9.862553	16.341682
C	16.109741	9.816698	15.025490
C	16.187227	8.652341	14.269538
C	16.765018	7.497595	14.808173
F	18.103422	32.502712	17.902649
F	10.897824	27.699677	18.099964
C	18.167177	28.785692	17.687860
C	14.109442	31.553652	18.056316
C	15.053612	30.535679	18.001308
C	16.443142	30.798807	17.979115
C	16.798380	32.161667	17.993771
C	14.396996	27.035757	17.851059
C	10.078773	28.572346	16.068991
C	11.127700	28.059727	16.818710
C	12.433148	27.913141	16.302095
C	12.643268	28.311769	14.960844
C	11.595578	28.809141	14.193142
C	10.316441	28.943520	14.743258
H	26.516897	11.030928	16.024248
H	24.286438	30.618361	16.062601
H	8.303616	18.889473	16.060055
C	15.872057	33.195499	18.053942
C	14.511003	32.891026	18.088539
H	15.566105	17.133175	9.490873
H	15.416317	15.501930	7.630185
H	17.282301	15.328532	5.972378
H	19.316948	16.768667	6.251579
H	24.480986	17.886730	9.684690

H	26.035818	18.518341	7.858548
H	25.307718	20.161203	6.120908
H	23.030445	21.204475	6.284181
H	23.468868	15.881398	10.032073
H	23.466003	15.921146	7.543640
H	21.769964	14.575109	6.287425
H	20.064535	13.249578	7.555300
H	27.412590	22.715719	11.313830
H	29.739983	22.301310	10.570820
H	30.515270	19.963261	10.134576
H	28.939081	18.050228	10.509596
H	25.366199	14.034428	9.547713
H	25.692146	11.568806	13.863919
H	25.694822	10.309012	11.720965
H	25.554054	11.536667	9.551758
H	18.214705	12.059022	11.242270
H	16.651976	10.265558	10.526096
H	14.242804	10.787994	10.141563
H	13.400430	13.121833	10.532110
H	14.073605	18.965031	10.029617
H	14.107653	18.949465	7.540923
H	13.971075	21.108278	6.289127
H	13.897909	23.269270	7.559898
H	17.144178	22.264406	6.260775
H	16.840946	24.746490	6.051217
H	17.884600	26.263851	7.737917
H	19.236149	25.308977	9.590854
H	24.099226	29.549513	14.005983
H	25.317459	30.163715	11.918567
H	24.477467	29.356697	9.711530
H	22.458923	27.887993	9.608274
H	26.595690	29.662573	16.241116
H	28.627108	30.835344	17.071426
H	30.243307	29.627836	18.536631
H	29.774193	27.255375	19.215799
F	20.302975	31.102175	18.095343
H	20.070086	33.215679	16.593943
H	23.926825	32.676006	14.705126
H	21.811337	33.970684	14.948639
H	19.263769	28.936907	12.490328
H	19.724890	31.325386	11.937538
H	18.330809	33.128380	12.945887
H	16.488384	32.535099	14.547071
H	17.013939	29.012741	10.515632
H	14.586512	29.526588	10.131935
H	12.870604	27.760120	10.530013
H	13.564563	25.492802	11.263949

H	16.235838	34.223343	18.064699
H	13.771852	33.692257	18.129305
H	13.050904	31.296253	18.069773
H	14.730416	29.499783	17.946751
H	27.767439	27.680613	11.367237
H	29.555532	28.684402	12.823396
H	30.189960	27.555090	14.954976
H	29.050346	25.454817	15.633834
H	30.332462	19.708885	18.043171
H	32.720078	20.293224	18.158621
H	34.457939	18.484488	18.153992
H	33.710735	16.085138	18.051153
H	32.177334	16.518135	14.496663
H	31.652153	14.688654	12.858117
H	29.353939	14.522702	11.889700
H	27.614740	16.181328	12.532793
F	29.093954	14.093076	18.094858
H	30.969145	13.186071	16.562536
H	30.675373	11.325239	14.906300
H	28.444435	10.245384	14.643911
H	24.661741	9.339692	16.613077
H	24.519857	7.026686	17.512405
H	22.435961	6.262400	18.650869
H	20.504133	7.846552	18.911638
H	22.472563	9.274104	11.463217
H	22.237860	7.210729	12.878638
H	20.743826	7.263636	14.884062
H	19.520832	9.343305	15.459388
H	15.657498	10.720170	14.619064
H	15.790744	8.646080	13.254434
H	16.827055	6.583323	14.216530
H	17.729057	6.623555	16.554501
H	14.137486	10.988036	17.863327
H	13.373332	8.647980	17.975338
H	10.926261	8.127987	18.077469
H	9.274422	10.029305	18.058266
H	12.315935	15.252497	12.648387
H	10.526067	10.896420	14.268798
H	10.037986	14.522088	11.950842
H	9.134547	12.335587	12.751899
F	9.895867	15.101628	17.896137
H	6.673164	17.616489	14.669897
H	6.610862	15.125761	14.798546
H	8.168902	13.919229	16.353077
H	11.588877	18.237896	9.555948
H	9.392096	19.429089	9.594418
H	8.318227	19.984373	11.776112

H	9.413016	19.301550	13.907135
H	21.603832	25.451227	10.028529
H	21.574566	25.434639	7.542884
H	23.544235	24.538662	6.288513
H	25.498629	23.611883	7.560454
H	32.491230	24.937401	16.542662
H	32.869160	24.248346	14.158182
H	31.480852	22.429981	13.161603
H	29.746759	21.292130	14.537249
H	10.362927	25.551844	15.461376
H	9.194305	23.109642	11.286012
H	7.395385	24.247993	12.619102
H	7.994548	25.462885	14.714827
H	13.644821	28.211376	14.543335
H	11.777258	29.096783	13.157329
H	9.497778	29.337166	14.139917
H	9.095358	28.668554	16.528746
H	8.774492	25.509842	19.132458
H	6.430731	24.698801	18.760571
H	6.037303	22.579100	17.498526
H	7.964592	21.331047	16.552551
F	10.896589	15.897956	20.904255
F	19.708355	26.899008	29.098944
F	19.496138	21.505234	31.100719
C	10.975931	21.771116	20.684914
C	10.125484	22.368559	21.361115
C	9.188168	23.083231	22.131950
C	8.246994	22.450436	22.973171
C	7.344941	23.199493	23.721573
C	7.372145	24.596621	23.662979
C	8.296376	25.253145	22.846045
C	9.179458	24.491112	22.093109
C	10.537321	18.192549	22.413158
C	11.547382	18.697563	22.930855
C	9.439155	17.522354	21.835205
C	8.109594	17.981409	21.970428
C	7.043846	17.261276	21.443365
C	7.275781	16.055199	20.773487
C	8.578417	15.579102	20.609259
C	9.636331	16.324514	21.112858
C	12.497884	15.766969	24.957460
C	17.565775	25.496874	27.499092
C	17.443926	20.481131	28.221384
C	17.455557	21.314018	29.143160
C	18.440777	22.336342	31.171827
C	17.422667	22.258245	30.193480
C	16.357351	23.184200	30.306011

C	16.304790	24.106085	31.344158
C	17.320793	24.136402	32.305702
C	18.396637	23.252062	32.215538
C	12.611268	26.961264	21.290365
C	13.486092	12.756963	22.041565
F	11.693136	17.095491	27.298841
C	13.671691	15.698529	24.560247
C	11.150275	15.817189	25.368984
C	10.750417	16.488682	26.545446
C	9.424698	16.547510	26.952961
C	8.447222	15.917773	26.178520
C	8.804088	15.237365	25.009811
C	10.133735	15.190420	24.611303
C	21.888029	21.366583	29.150244
C	21.771202	25.618462	27.513979
C	21.908823	25.614613	26.277580
C	21.717049	25.596912	28.930382
C	22.708427	24.894724	29.660011
C	22.720385	24.863810	31.048105
C	21.730190	25.535923	31.770020
C	20.722525	26.220913	31.091351
C	20.719540	26.238478	29.702454
F	18.499292	19.090570	31.099579
F	13.895568	16.704723	29.097473
C	13.902987	19.125210	27.524611
C	13.814571	19.227566	26.286922
C	13.975207	19.093563	28.942652
C	14.099569	20.296442	29.682106
C	14.132386	20.309996	31.070358
C	14.042573	19.112309	31.785353
C	13.953479	17.903109	31.097918
C	13.937802	17.904974	29.709206
F	21.300835	19.305923	31.097851
C	21.167000	21.823755	28.244370
C	22.474688	19.962378	31.138433
C	22.778938	20.950939	30.171486
C	24.065742	21.538578	30.265745
C	24.959249	21.197206	31.273016
C	24.602335	20.241953	32.230732
C	23.357710	19.619455	32.155571
F	25.692833	16.495275	29.100574
C	25.474468	19.193398	27.518717
C	20.491835	17.914923	28.219322
C	19.757977	17.481268	29.125219
C	18.352589	17.754028	31.150785
C	18.961884	16.944458	30.163485
C	18.740042	15.549678	30.263828



C	17.990585	15.005118	31.299541
C	17.428095	15.839640	32.271660
C	17.603720	17.220430	32.192242
C	16.211720	15.477386	27.530722
C	23.491575	15.498253	27.512243
C	23.402098	15.413953	26.274788
C	23.508410	15.519795	28.928596
C	22.385614	15.048203	29.653370
C	22.362474	15.024960	31.041536
C	23.470963	15.472624	31.766407
C	24.589256	15.961632	31.091957
C	24.593948	15.990730	29.703266
F	20.502556	29.903944	20.905254
C	25.550884	26.807476	20.679314
C	26.518520	27.217358	21.339947
C	27.570492	27.726467	22.132374
C	27.369532	28.826839	22.997719
C	28.404076	29.327423	23.780657
C	29.670130	28.734810	23.733519
C	29.902321	27.643400	22.895538
C	28.863228	27.162516	22.109245
C	22.633944	28.988655	22.441465
C	22.574507	27.848213	22.929041
C	22.623220	30.292496	21.906027
C	23.687286	31.199478	22.113220
C	23.628119	32.501190	21.631510
C	22.496161	32.936157	20.934002
C	21.429846	32.064430	20.704138
C	21.512276	30.757698	21.166748
C	19.605125	28.468693	25.004974
C	29.241579	22.910170	21.322277
C	16.528593	29.154726	22.005266
F	21.296637	28.507275	27.297649
C	18.928928	27.513140	24.588444
C	20.333323	29.610212	25.412056
C	21.164289	29.627655	26.555664
C	21.861891	30.760893	26.953138
C	21.750614	31.931791	26.200556
C	20.948345	31.952841	25.055285
C	20.253479	30.813684	24.669617
F	27.704731	14.492311	20.710663
C	22.602728	11.677752	20.671181
C	22.546633	10.626621	21.326452
C	22.427563	9.435126	22.067181
C	23.428541	8.970334	22.947899
C	23.250662	7.800676	23.678244
C	22.065109	7.069614	23.553507

C	21.057545	7.497512	22.683905
C	21.256542	8.659977	21.952183
C	25.944393	13.122414	22.400364
C	24.989822	13.722653	22.921808
C	27.098116	12.504645	21.874197
C	27.420376	11.159604	22.168596
C	28.624514	10.600739	21.758059
C	29.544426	11.377739	21.046202
C	29.245243	12.699864	20.710747
C	28.021538	13.236732	21.091961
C	27.040592	15.984471	24.981295
C	17.379011	10.446972	21.265892
C	29.177216	18.292765	21.967268
F	26.304764	14.499750	27.296967
C	26.536966	17.046818	24.579168
C	27.669060	14.775085	25.358324
C	27.293222	14.037309	26.503664
C	27.899740	12.838052	26.853508
C	28.929396	12.335217	26.056543
C	29.341625	13.041996	24.922018
C	28.721432	14.237118	24.579365
C	14.015864	26.216267	24.962147
C	17.251925	12.074211	24.930243
C	27.892273	21.934710	24.948940
F	25.304068	24.702450	27.504511
C	25.595026	25.107046	24.056173
C	25.544498	25.872181	25.033007
C	25.487820	26.667362	26.195501
C	25.511471	28.079502	26.164742
C	25.480324	28.820711	27.340363
C	25.427841	28.171961	28.578548
C	25.382563	26.776962	28.644236
C	25.395395	26.053534	27.461674
F	21.095930	12.897610	27.504435
C	21.131187	12.464906	24.042408
C	21.845419	12.099482	24.991177
C	22.597111	11.711007	26.120155
C	23.770283	10.928128	26.037962
C	24.459373	10.544703	27.182520
C	24.002541	10.936440	28.445160
C	22.857584	11.728282	28.563091
C	22.187895	12.106339	27.409462
F	13.094523	22.504364	27.502752
C	12.422120	22.683176	24.067780
C	11.812606	22.289198	25.075729
C	11.169082	21.889994	26.265312
C	9.867967	21.338421	26.288593

C	9.256222	20.997160	27.489466
C	9.919802	21.205202	28.702209
C	11.213573	21.731930	28.714115
C	11.821580	22.041100	27.506378
F	17.903221	13.300004	27.904922
C	16.632635	16.604681	27.217495
C	14.769301	11.662610	28.702772
C	13.866982	12.701741	28.455002
C	14.328055	13.951971	28.058485
C	15.711900	14.206592	27.902580
C	16.582096	13.119040	28.121235
C	16.138950	11.868964	28.527382
F	14.894088	25.096418	27.905802
C	18.277802	24.521826	27.204870
C	14.972662	28.648668	28.629892
C	16.316854	28.926441	28.360701
C	17.183489	27.910028	27.974621
C	16.728010	26.576828	27.856062
C	15.359726	26.347769	28.096767
C	14.483779	27.347172	28.491554
F	26.498522	21.707388	27.905111
C	24.274509	19.089106	27.210951
C	29.500736	19.835209	28.683786
C	29.057356	18.532940	28.427996
C	27.745056	18.301712	28.029819
C	26.828547	19.369434	27.887968
C	27.328701	20.666887	28.115086
C	28.632336	20.915833	28.516668
F	12.898137	28.505562	23.946430
C	15.167285	25.960600	24.577223
C	12.713998	26.600183	25.341015
C	11.920639	25.863478	26.249477
C	10.639489	26.289370	26.583500
C	10.117717	27.463106	26.028824
C	10.879035	28.218229	25.132309
C	12.153089	27.778326	24.805637
F	15.897308	9.899299	23.909788
C	16.883013	13.204921	24.572807
C	17.607014	10.761971	25.310041
C	18.654947	10.477298	26.216776
C	18.956573	9.166101	26.569403
C	18.218878	8.102796	26.036840
C	17.177633	8.349108	25.138529
C	16.895809	9.661296	24.786524
F	30.502750	21.699213	24.105682
C	27.077993	21.077333	24.571306
C	28.863796	22.877241	25.345318

C	28.568817	23.976879	26.183468
C	29.556171	24.893005	26.530190
C	30.866173	24.730515	26.065378
C	31.192318	23.647299	25.245173
C	30.194435	22.748390	24.897999
F	31.302114	24.902376	21.297867
F	30.699894	16.099100	21.099777
C	28.018768	23.097240	21.456930
C	32.435593	20.951206	21.176172
C	31.085192	21.275152	21.221462
C	30.631527	22.614716	21.239677
C	31.643061	23.597347	21.228762
C	32.997211	23.294733	21.182531
C	33.401218	21.960255	21.154865
C	28.378668	18.927660	21.259848
C	31.850719	15.947968	23.149197
C	30.894016	16.563108	22.353813
C	30.125603	17.660133	22.799801
C	30.367390	18.116743	24.117348
C	31.312941	17.500597	24.929016
C	32.056278	16.417759	24.448545
F	9.891494	27.696819	21.297739
F	17.701958	31.502270	21.097359
C	12.990431	25.787920	21.460495
C	12.660753	30.716673	21.094761
C	13.086955	29.394436	21.132618
C	12.177882	28.312901	21.178400
C	10.817783	28.672579	21.193775
C	10.366507	29.984030	21.150398
C	11.297698	31.021950	21.100237
C	16.369953	28.165600	21.271971
C	17.287786	32.645542	23.115671
C	17.207972	31.489275	22.352451
C	16.618744	30.298519	22.827806
C	16.095755	30.324265	24.141836
C	16.178076	31.472736	24.921638
C	16.774788	32.631718	24.414909
F	18.103668	7.696955	21.297853
F	10.897022	12.500032	21.099344
C	18.164558	11.396104	21.441010
C	14.107886	8.621779	21.044090
C	15.046969	9.644585	21.090317
C	16.435913	9.387864	21.150610
C	16.798529	8.027000	21.175852
C	14.396269	13.129915	21.283966
C	10.096967	11.639420	23.144886
C	11.139910	12.137750	22.377386

C	12.454986	12.269828	22.872501
C	12.681110	11.868377	24.209826
C	11.640790	11.384198	24.995789
C	10.350760	11.267102	24.467615
H	26.375500	29.272846	23.027946
H	24.345592	9.551670	23.035002
H	8.248232	21.361208	23.016056
C	15.878105	6.988547	21.126207
C	14.516399	7.286582	21.060589
H	15.585949	23.172787	29.536907
H	15.479124	24.816355	31.397570
H	17.284435	24.859566	33.121197
H	19.216082	23.267437	32.933586
H	24.348104	22.262667	29.503582
H	25.942087	21.667715	31.304401
H	25.295010	19.968418	33.027973
H	23.054279	18.854084	32.869335
H	23.463734	24.361135	29.086969
H	23.494045	24.297710	31.567457
H	21.731365	25.517254	32.860313
H	19.922079	26.735947	31.621971
H	27.399626	17.295200	27.812653
H	29.740475	17.690351	28.537439
H	30.528399	20.017462	28.999487
H	28.954130	21.944700	28.672966
H	25.315651	26.254435	29.596802
H	25.548870	28.566628	25.192688
H	25.494616	29.909582	27.293167
H	25.411331	28.749369	29.503416
H	18.226612	28.120893	27.750864
H	16.693163	29.945065	28.455090
H	14.296279	29.448210	28.934322
H	13.435923	27.105396	28.662281
H	14.186336	21.222279	29.118893
H	14.248414	21.258062	31.596546
H	14.061329	19.115925	32.875446
H	13.914809	16.946230	31.618444
H	17.160679	17.899664	32.920334
H	16.841948	15.417142	33.088409
H	17.836573	13.926910	31.343645
H	19.157200	14.908137	29.489542
H	24.119289	10.637115	25.050442
H	25.360880	9.938153	27.090742
H	24.541552	10.638593	29.344538
H	22.494120	12.067315	29.532255
H	26.705866	10.575354	22.748257
H	28.853334	9.562092	21.999962

H	30.497274	10.949154	20.733383
H	29.937635	13.318264	20.144125
F	20.305000	9.096259	21.104187
H	20.123909	6.949402	22.569891
H	24.036917	7.461429	24.353828
H	21.918154	6.157871	24.134010
H	19.225050	11.311881	26.621452
H	19.775673	8.967820	27.261103
H	18.454832	7.076466	26.319326
H	16.584133	7.543969	24.704893
H	16.864340	11.069929	28.676952
H	14.410713	10.683471	29.021881
H	12.795085	12.536546	28.568628
H	13.631941	14.761337	27.854837
H	16.245329	5.962060	21.148804
H	13.782361	6.480187	21.035231
H	13.049078	8.874609	21.003523
H	14.718674	10.680137	21.111841
H	27.549364	12.315619	27.743151
H	29.408482	11.392074	26.323463
H	30.140207	12.652467	24.290564
H	29.033335	14.788630	23.694288
H	30.338381	20.486170	21.263493
H	32.731682	19.903049	21.158230
H	34.463089	21.715034	21.123123
H	33.715096	24.114870	21.170595
H	32.202805	23.493330	24.867014
H	31.640411	25.449940	26.336365
H	29.302277	25.743685	27.162407
H	27.544968	24.092340	26.533766
F	29.093056	26.108919	21.301920
H	30.872086	27.149330	22.845654
H	30.480139	29.119884	24.353601
H	28.224356	30.176201	24.440886
H	24.554668	30.855392	22.675102
H	24.464491	33.180000	21.800558
H	22.446032	33.956333	20.552246
H	20.542067	32.369305	20.153278
H	22.481731	30.707113	27.847847
H	22.294237	32.826591	26.508011
H	20.867712	32.862190	24.458944
H	19.627436	30.822195	23.778801
H	15.632268	29.417812	24.528868
H	15.769815	31.464418	25.932180
H	16.844439	33.528439	25.031652
H	17.750311	33.534588	22.687803
H	14.148441	29.166574	21.153847

H	13.404052	31.513226	21.067284
H	10.955673	32.057434	21.075199
H	9.292605	30.168604	21.162054
H	12.336325	24.948826	26.668764
H	10.501798	29.136341	24.681686
H	10.040562	25.698105	27.276291
H	9.112803	27.794302	26.292974
F	10.089648	25.096214	21.303421
H	6.623730	22.693039	24.362801
H	6.674573	25.181690	24.262808
H	8.347402	26.339033	22.789701
H	11.754761	21.882788	29.646646
H	9.440868	20.945942	29.647018
H	8.255569	20.564175	27.481379
H	9.357206	21.190128	25.338755
H	21.527990	14.708735	29.077309
H	21.470961	14.670170	31.558683
H	23.463871	15.454746	32.856937
H	25.464212	16.332514	31.625854
H	32.419231	15.111126	22.743238
H	32.798515	15.932527	25.083431
H	31.470642	17.869114	25.942608
H	29.783016	18.960958	24.481789
H	10.427929	14.667567	23.702801
H	9.172855	17.086090	27.866224
H	7.403787	15.958557	26.492983
H	8.041955	14.748777	24.402409
H	13.689416	11.954926	24.613062
H	11.840704	11.093636	26.027464
H	9.537216	10.881405	25.082264
H	9.104856	11.552548	22.702368
H	8.793708	14.655216	20.076752
H	6.442657	15.485633	20.359980
H	6.028215	17.641428	21.552322
H	7.938783	18.912771	22.509279